



## United States Department of the Interior

FISH AND WILDLIFE SERVICE  
Sacramento Fish and Wildlife Office  
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Sacramento, California 95825-1846



In reply refer to:  
1-1-04-F-0119

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Mr. Gene Fong  
Division Administrator  
Federal Highway Administration  
U.S. Department of Transportation  
650 Capitol Mall, Suite 4-100  
Sacramento, California 95814

Subject: Section 7 Consultation for the Proposed Route 65 Lincoln Bypass Project  
Placer County, California

Dear Mr. Fong:

This is in response to the Federal Highway Administration's (FHWA) request for formal consultation with the U.S. Fish and Wildlife Service (Service) on the proposed Route 65 Lincoln Bypass project (proposed project) in Placer County, California. Your May 10, 2004, request was received in our office on May 13, 2004. This document represents the Service's biological opinion on the effects of the action on the federally threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) (beetle), the federally endangered vernal pool tadpole shrimp (*Lepidurus packardii*) and threatened vernal pool fairy shrimp (*Branchinecta lynchi*) (vernal pool crustaceans), and designated critical habitat for the vernal pool fairy shrimp, in accordance with section 7 of the Endangered Species Act of 1973, as amended (Act).

The findings and recommendations in this consultation are based on: (1) a January 21, 2005, letter from FHWA to the Service, providing comments on the draft biological opinion; (2) the November 2004 *Draft Mitigation and Monitoring Proposal for Route 65 Lincoln Bypass, Placer County, California* (MMP), prepared by LSA Associates (LSA), the consultant; (3) the September 7, 2004, letter from FHWA to the Service requesting initiation of formal consultation on proposed project; (4) the August 2004 *Supplement to Biological Assessment for U.S. Fish and Wildlife Service Consultation: Route 65 Lincoln Bypass, Placer County* (Supplement), prepared by LSA; (5) a June 22, 2004, site visit conducted by representatives of the Service, the California Department of Transportation (Caltrans), FHWA, LSA, and Placer County Transportation Planning Authority (County); (6) the May 2004 *Indirect and Cumulative Impact Analysis for Lincoln Bypass—State Route 65, Placer County, California* document, prepared by Caltrans; (7) the *Route 65 Lincoln Bypass Biological Assessment* (Biological Assessment), dated February 2004, revised April 2004, prepared by LSA; (8) meetings, electronic mail (email)

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correspondence, and telephone conversations between representatives of the Service, FHWA, Caltrans, and LSA; (9) the November 14, 2001, *Draft Environmental Impact Statement/Report and 4(f) Evaluation for Lincoln Bypass, Placer County, State Route 65* (DEIS/R), prepared by Caltrans; (10) the November 18, 1999, *Route 65 Lincoln Bypass Natural Environmental Study Report*, prepared by Caltrans; and (11) other information available to the Service.

### **Consultation History**

*February 26, 2004.* Caltrans submitted a letter to the Service requesting our review of the enclosed draft Biological Assessment. The Service received this letter and enclosures on March 1, 2004.

*March 17, 2004.* The Service submitted a letter to Caltrans (Service file number 1-1-04-I-1062), providing our comments and suggestions on the draft Biological Assessment.

*April 28, 2004.* Kelly Fitzgerald and Ken Sanchez of the Service attended a meeting at Aitken Ranch, Placer County. This meeting included representatives of the Service, U.S. Army Corps of Engineers (Corps), California Department of Fish and Game (CDFG), Wildlands, Inc., Caltrans, and FHWA. Wildlands, Inc. and Caltrans discussed the use of Aitken Ranch as a possible site to offset the effects of the proposed project on vernal pool habitat crustacean habitat.

*April 30, 2004.* Caltrans submitted a letter to the Service, providing responses to our comments on the draft Biological Assessment.

*May 4, 2004.* Representatives of the Service, FHWA, Caltrans, and LSA met to discuss the proposed project. Caltrans provided the Service with copies of the DEIS/R and a report analyzing the indirect and cumulative effects of the proposed project. Participants discussed additional information that was needed to complete the formal consultation initiation package.

*May 10, 2004.* FHWA submitted a letter to the Service requesting the initiation of formal consultation on the proposed project. Enclosed was a revised Biological Assessment. The Service received the letter and enclosure on May 13, 2004.

*May 24, 2004.* The Service submitted a letter to FHWA requesting additional information on the proposed project (Service file number 1-1-04-I-1770). Requested information included: (1) a projected timeline for project construction; (2) a quantification of acreages of the proposed project footprint; (3) an identification, quantification, and analysis of the effects of the fill source; (4) a revision of the analysis guidelines used to analyze direct and indirect affects associated with the proposed project; and (5) a description and/or revision of proposed conservation measures to avoid, minimize, and offset direct and indirect affects on vernal pool crustaceans and their habitat.

*June 22, 2004.* Kelly Fitzgerald and Ken Fuller of the Service conducted a tour of the proposed project site with representatives of FHWA, Caltrans, LSA, and the County.

*July 20, 2004.* Kelly Fitzgerald and Ken Sanchez met with representatives of Caltrans, the County, and the City of Lincoln to discuss the proposed project. Caltrans presented their revised analysis of the direct and indirect affects that would result from the proposed project. The Service and Caltrans discussed appropriate compensation guidelines, and Caltrans presented options they are pursuing with regards to offsetting the effects of the proposed project on vernal pool crustacean habitat. The Service indicated that additional analysis on the effects to vernal pool fairy shrimp critical habitat was necessary.

*August 19, 2004.* Representatives of the Service met to discuss a Service-analysis of the effects the proposed project would have on vernal pool crustacean habitat and designated critical habitat.

*September 7, 2004.* FHWA submitted a letter to the Service requesting the initiation of formal consultation on the proposed project. Enclosed was a Supplement to the Biological Assessment. The Service received this letter and enclosures on September 7, 2004.

*September 16, 2004.* Representatives of the Service, FHWA, Caltrans, and LSA met to discuss the proposed project. The Service stated that the U.S. Department of Interior had issued a moratorium on the signing of biological opinions that pertain to proposed projects occurring in designated or proposed critical habitat. The Service presented our recommendations for effectively offsetting direct and indirect effects to vernal pool crustaceans habitat and critical habitat.

*November 1, 2004.* Representatives of the Service, FHWA, and the County met with Congressman Doolittle to discuss the effects and conservation measures for the proposed project.

*November 5, 2004.* Representatives of the Service, FHWA, Environmental Protection Agency (EPA), Corps, Caltrans, and the County met to discuss the effects and conservation measures for the proposed project.

*November 19, 2004.* Caltrans submitted a letter and the Draft MMP to the Service. The Service received these on November 22, 2004.

*January 7, 2005.* The Service issued a draft biological opinion for the proposed project to FHWA (Service file number 1-1-05-I-0418).

*January 21, 2005.* FHWA submitted a letter to the Service, providing comments on the draft biological opinion.

## **BIOLOGICAL OPINION**

### **Description of the Proposed Action**

The project proponents, Caltrans in conjunction with FHWA, propose to modify the existing State Route (SR) 65 near the City of Lincoln. A total of six highway bypass alternatives were initially evaluated by Caltrans. Based on environmental review and public comment; the

preferred alternative (*i.e.*, the proposed project) was determined by Caltrans to affect a less wetlands than the other alternatives (LSA 1999; Caltrans 2001). The proposed project will construct a new 12.8-mile alignment of SR 65 to the west of Lincoln, including a four-lane freeway with four interchanges. Interchanges would be constructed at Industrial Avenue, Nelson Lane, Riosa Road, and Wise Road. Bridges will be constructed at North and South Ingram Slough, Auburn Ravine, Markham Ravine, Airport Creek, Coon Creek, and three branches of Yankee Slough. The ultimate freeway will have a 78-foot median width and a 300-foot minimum right-of-way. The total 1,755-acre proposed action area includes the project alignment footprint and 250-foot zones of indirect affects on either side of the alignment (LSA 2004a).

As stated on page 2 of the Biological Assessment, the stated purpose of the proposed project is "to relieve congestion and improve safety on existing Route 65 in the vicinity of the City of Lincoln and provide for a regional traffic solution to accommodate projected traffic volumes for the year 2025." The proposed project includes several conservation easements, as well as numerous avoidance and minimization measures, which are described in further detail on pages 8-9 of the Biological Assessment.

The proposed project will adversely affect the beetle by directly affecting two elderberry (*Sambucus* sp.) shrubs, which are its obligate host plant. The proposed project will also adversely affect, directly and indirectly, 47.898 wetted acres of vernal pool crustacean habitat. Furthermore, approximately 40.713 wetted acres of this is located within designated critical habitat for the vernal pool fairy shrimp.

#### Proposed Project Footprint and Action Area

The 1,755-acre proposed project action area includes both the proposed 12.8-mile alignment right-of-way footprint and a 250-foot "indirect effects" zone on either side of this alignment (LSA 2004a). The "indirect effects" zone may extend to greater than a 250-foot distance from the edge of the proposed alignment. This may occur if a vernal pool crustacean habitat feature (*e.g.*, vernal pool or vernal swale) extends beyond 250 feet from the edge of the proposed alignment and maintains hydrological connectivity and is contiguous with the features and/or within the same vernal pool complex.

The proposed action area includes the proposed project footprint as well as the area contained within a four-mile circle (*i.e.*, two-mile radius) around each of the four proposed intersections/interchanges (*i.e.*, Industrial Avenue, Nelson Lane, Riosa Road, and Wise Road). The action area is used to evaluate possible indirect and cumulative effects that may result from the implementation of the proposed project.

#### **Proposed Conservation Measures**

The applicant has proposed conservation measures to avoid, minimize, and compensate for effects to the beetle and vernal pool crustaceans that result from the implementation of the proposed project.

Valley Elderberry Longhorn Beetle

1. The 2 elderberry shrubs, which are located within 20 feet of the centerline of the proposed alignment of the project and cannot be avoided, will be transplanted to a Service-approved conservation area that will be protected in perpetuity.
2. To compensate for direct affects to the beetle, prior to ground breaking activities at the project site, the project proponents will establish 29 rooted elderberry seedlings and 29 associated native plants at a Service-approved conservation area (see Table 1).
3. The proposed conservation area is the 317-acre Aitken Ranch property, located west of the City of Lincoln in western Placer County (*see* page 53 of the Biological Assessment and page 76 of the MMP). The project applicant proposes to establish the two transplanted shrubs and the seedlings and plantings on this property. The minimum area required is 0.24 acre (10,440 square feet) to ensure that no more than five elderberry seedlings and five associated native plants are planted per 1,800 square feet. The conservation area shall be managed in perpetuity as outlined in the Beetle Conservation Guidelines (Service 1999). Wildlands, Inc. will oversee the transplanting and long-term management and supervision of the conservation area.

**Table 1: Elderberry Stem Size and Stem Numbers and Compensation; Route 65  
Lincoln Bypass Project, Placer County, California**

Stem Size	# of stems	Exit Holes	Elderberry Seedling Ratio	# Elderberry Seedlings	Associate Native Spp. Ratio	# Associate Native Spp.
1"-3"	3	No	2:1	6	1:1	6
1"-3"	0	Yes	4:1	0	2:1	0
3"-5"	5	No	3:1	15	1:1	15
3"-5"	0	Yes	6:1	0	2:1	0
>5"	2	No	4:1	8	1:1	8
>5"	0	Yes	8:1	0	2:1	0
<b>Total</b>	<b>10</b>			<b>29</b>		<b>29</b>
<i>* All elderberry shrubs are located in riparian habitat.</i>						

Vernal Pool Crustacean Species

## 1. Habitat Preservation/Creation

Approximately 40.50 wetted acres of vernal pool crustacean habitat will be directly (26.94 wetted acres) and indirectly (13.56 wetted acres) affected by the proposed project (refer to Table 2). The project applicant has proposed to compensate acre for acre for the loss of function and value of these vernal pool crustacean habitats through the preservation of vernal pool crustacean habitat, located primarily in Placer County. Direct affects will be compensated through a combination of creation and preservation of vernal pool crustacean habitat.

Indirect affects will be compensated through the preservation of vernal pool crustacean habitat. Therefore, prior to ground-breaking, the applicant will preserve in perpetuity approximately 97.59 wetted acres of existing vernal pool crustacean habitat, including 11.06 wetted acres on Aitken Ranch, approximately 79 wetted acres on the Rockwell-Mariner property, and 7.53 wetted acres at the Bryte Ranch Conservation Bank. In addition, the applicant will create approximately 10.35 wetted acres of vernal pool crustacean habitat at Aitken Ranch, which will be protected in perpetuity. Vernal pool crustacean habitat preservation and creation will be accomplished through the acquisition of specified properties, such as Aitken Ranch and the Rockwell-Mariner property in Placer County, and the purchase of vernal pool crustacean habitat credits Bryte Ranch Conservation Bank in Sacramento County (refer to Table 3).

**Table 2: Proposed Compensation for Vernal Pool Crustacean Habitat for the Route 65 Lincoln Bypass Project, Placer County, California**

	<b>Acreage Affected</b>	<b>Acres of Preservation</b>	<b>Acres of Creation</b>
<b>Direct Total</b>	26.94	70.47	10.35
<b>Indirect Total</b>	13.56	27.12	--
<b>TOTAL</b>	<b>40.50</b>	<b>97.59</b>	<b>10.35</b>

**Table 3: Proposed Conservation Areas to Create and Preserve Vernal Pool Habitat in Perpetuity for the Route 65 Lincoln Bypass, Placer County**

	<b>Aitken Ranch (in acres)</b>	<b>Rockwell- Mariner (in acres)</b>	<b>Bryte Ranch (in acres)</b>	<b>TOTAL ACREAGE</b>
<b>Preservation</b>	11.06	~79.00	7.53	97.59
<b>Creation</b>	10.35	--	--	10.35
<b>TOTAL</b>	<b>21.41</b>	<b>~79.00</b>	<b>7.53</b>	<b>107.94</b>

## 2. Avoidance and Minimization Measures

- a. As described on pages 56-59 of the Biological Assessment, the project proponent will implement several avoidance and minimization measures to reduce the effects the proposed project would have on listed vernal pool crustacean habitat and designated critical habitat. Measures, which will be implemented during project construction to avoid adverse affects to these habitat features, include the following:
  - i. All wetlands, riparian areas, and other sensitive vegetation/habitats adjacent to designated work areas will be designated as Environmentally Sensitive Areas (ESAs) and clearly indicated as such on project construction plans. Project specifications will include a requirement that ESAs are clearly delineated with brightly colored fencing, rope, or equivalent prior to beginning construction.

- ii. Measures consistent with the current Caltrans' Construction Site Best Management Practices (BMPs) Manual, including the Storm Water Pollution Prevention Plan (SWPPP) and Water Pollution Control Program (WPCP) Manuals, will be implemented. Best management practices will be implemented to reduce erosion, dust, noise, and other deleterious aspects of construction related activities. These practices are described at: [http://www.dot.ca.gov/hq/construc/Construction\\_Site\\_BMPs.pdf](http://www.dot.ca.gov/hq/construc/Construction_Site_BMPs.pdf).

The biological conservation measures, as proposed above and in the project materials reviewed by the Service, are considered part of the proposed actions evaluated by the Service in this biological opinion. Any change in these plans or their implementation that might adversely affect listed species, either directly or indirectly, requires re-initiation of consultation with the Service, as set forth in the final paragraphs of this letter.

### **Status of the Species**

#### Valley Elderberry Longhorn Beetle

On August 8, 1980, the valley elderberry longhorn beetle was listed as a threatened species (45 FR 52803). Critical habitat for this species was designated and published at 50 CFR §17.95. Two areas along the American River in the Sacramento metropolitan area have been designated as critical habitat for the beetle. These designated areas of critical habitat are the American River Parkway Zone, an area along the lower American River at Goethe and Ancil Hoffman Parks, and the Sacramento Zone, an area located approximately one-half-mile from the American River downstream from the American River Parkway Zone. In addition, an area along Putah Creek, Solano County, and the area east of Nimbus Dam along the American River Parkway, Sacramento County, are considered essential habitat, according to the Recovery Plan for the beetle (Service 1984). These critical and essential habitat areas support large numbers of mature elderberry shrubs with extensive evidence of use by the beetle.

The beetle is dependent on its host plant, elderberry, which is a locally common component of the remaining riparian forests and savannah areas and, to a lesser extent, the mixed chaparral-foothill woodlands of the Central Valley. Each stage of the beetle's life cycle requires a slightly different part of the elderberry plant as its habitat. The adult beetles feed on the flowers. Females lay eggs on the bark. The larvae burrow into the wood after hatching from their eggs. Larvae feed down the pith of a healthy stem into the larger living branches (Halstead and Oldham 2000). Use of the elderberry shrubs by the beetle is rarely apparent. Frequently, the only exterior evidence of the shrub's use by the beetle is an exit hole created by the larva just prior to the pupal stage. Emergence holes are usually observed in living stems more than one inch in diameter and less than nine feet from the ground (Talley and Holyoak, in prep.). Observations made of elderberry shrubs along the Cosumnes River, in the Folsom Lake area and near Blue Ravine in Folsom indicate that the beetle may be present in an elderberry shrubs with no evidence of exit holes; the larvae either succumb prior to constructing an exit hole or are not far enough along in the developmental process to construct an exit hole. Larvae appear to be distributed in stems which are one inch or greater in diameter at ground level. The *Valley*

*Elderberry Longhorn Beetle Recovery Plan* (Service 1984) and Barr (1991) contain further details on the beetle's life history.

#### Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp

The vernal pool tadpole shrimp and vernal pool fairy shrimp were listed as endangered and threatened, respectively, on September 19, 1994 (59 FR 48136). The final rule to designate critical habitat for 15 vernal pool species, including two crustaceans, was published on August 6, 2003 (68 FR 46684). Further information on the life history and ecology of the vernal pool fairy shrimp and vernal pool tadpole shrimp may be found in the final listing rule, the final rule to designate critical habitat, Eng *et al.* (1990), Helm (1998), and Simovich *et al.* (1992).

The vernal pool tadpole shrimp has dorsal compound eyes, an approximately one-inch (2.5-cm) long large shield-like carapace that covers most of its body, and a pair of long cercopods at the end of its last abdominal segment (Linder 1952; Longhurst 1955; Pennak 1989). It is primarily a benthic animal that swims with its legs down. Vernal pool tadpole shrimp climb or scramble over objects, and plow along bottom sediments as they forage for food. Its diet consists of organic detritus and living organisms, such as fairy shrimp and other invertebrates (Pennak 1989; Fryer 1987). The females deposit their eggs on vegetation and other objects on the pool bottom. Tadpole shrimp eggs are known as cysts, and during the dry months of the year, they lie dormant in the dry pool sediments (Lanaway 1974; Ahl 1991).

The life history of the vernal pool tadpole shrimp is linked to the environmental characteristics of its vernal pool habitat. After winter rains fill the pools, its dormant cysts may hatch in as little as four days (Ahl 1991, Rogers 2001), and the animals may become sexually mature within three to four weeks after hatching (Ahl 1991; Helm 1998; King 1996). A portion of the cysts hatch immediately and the rest remain dormant in the soil to hatch during later rainy seasons (Ahl 1991). The vernal pool tadpole shrimp is a relatively long-lived species (Ahl 1991), and will generally survive for as long as its habitat remains inundated, sometimes for six months or more (Ahl 1991, Gallagher 1996, Helm 1998). Adults are often present and reproductive until the pools dry up in the spring (Ahl 1991; Gallagher 1996; Simovich *et al.* 1992).

Vernal pool tadpole shrimp are found only in ephemeral freshwater habitats, including alkaline pools, clay flats, vernal lakes, vernal pools, vernal swales, and other seasonal wetlands in California (Helm 1998). The vernal pool tadpole shrimp is known from 168 occurrences in the Central Valley (CNDDB 2004), ranging from east of Redding in Shasta County south to Fresno County, and from a single vernal pool complex located in the San Francisco Bay National Wildlife Refuge in Alameda County. It inhabits vernal pools containing clear to highly turbid water, ranging in size from 54 square feet (5 square meters) in the Mather Air Force Base area of Sacramento County, to the 89-acre Olcott Lake at Jepson Prairie in Solano County; the potential ponding depth of occupied habitat ranges from 1.5 inches to 59 inches. Although vernal pool tadpole shrimp are found on a variety of geologic formations and soil types, Helm (1998) found that over 50 percent of vernal pool tadpole shrimp occurrences were on High Terrace landforms and Redding and Coming soils. Vernal pool tadpole shrimp are uncommon even where vernal pool habitat occurs (Service 2004). The largest concentration of vernal pool tadpole shrimp occurrences are found in the Southeastern Sacramento Valley Vernal Pool Region, as defined in



the Service's *Draft Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (2004). In this vernal pool region, this species occurs on a number of public and private lands in Sacramento County, and from a few locations in Yuba and Placer Counties, including Beale Air Force Base.

Vernal pool fairy shrimp have delicate elongate bodies, large stalked compound eyes, no carapace, and 11 pairs of phyllopods, or gill-like structures that also serve as legs. Typically less than one-inch (2.5-cm) long, they swim or glide gracefully upside-down by means of complex, wavelike beating movements. Fairy shrimp feed on algae, bacteria, protozoa, rotifers, and detritus. The second pair of antennae in adult male fairy shrimp are greatly enlarged and specialized for clasping the females during copulation. The females carry eggs in an oval or elongate ventral brood sac. The eggs are either dropped to the pool bottom or remain in the brood sac until the female dies and sinks. The dormant cysts are capable of withstanding heat, cold, and prolonged desiccation, and they can remain viable in the soil for decades after deposition. When the pools refill in the same or subsequent seasons, some, but not all, of the cysts may hatch. The cyst bank in the soil may therefore be comprised of cysts from several years of breeding (Donald 1983). The early stages of the fairy shrimp develop rapidly into adults and may become sexually mature within two weeks after hatching (Gallagher 1996; Helm 1998). Such quick maturation permits populations to persist in short-lived shallow bodies of water (Simovich *et al.* 1992). In pools that persist for several weeks to a few months, fairy shrimp may have multiple hatches during a single season (Helm 1998; Gallagher 1996).

Vernal pool fairy shrimp are found only in ephemeral freshwater habitats, including alkaline pools, ephemeral drainages, rock outcrop pools, vernal pools, and vernal swales in California and Southern Oregon (Eriksen and Belk 1999). Occupied habitats range in size from rock outcrop pools as small as 11 square feet to large vernal pools up to 12 acres; the potential ponding depth of occupied habitat ranges from 1.2 inches to 48 inches.

The vernal pool fairy shrimp is known from 342 occurrences extending from the Stillwater Plain in Shasta County through most of the length of the Central Valley to Pinnacles in San Benito County (Eng *et al.* 1990; Fugate 1992; Sugnet and Associates 1993; CNDDDB 2004). Five additional, disjunct populations exist: one near Soda Lake in San Luis Obispo County; one in the mountain grasslands of northern Santa Barbara County; one on the Santa Rosa Plateau in Riverside County; one near Rancho California in Riverside County; and one on the Agate Desert near Medford, Oregon (CNDDDB 2004; Helm 1998; Eriksen and Belk 1999; Volmar 2002; Service 1994, 2003). Three of these isolated populations each contain only a single pool known to be occupied by the vernal pool fairy shrimp. Although the vernal pool fairy shrimp is distributed more widely than most other fairy shrimp species, it is generally uncommon throughout its range, and rarely abundant where it does occur (Eng *et al.* 1990; Eriksen and Belk 1999). The greatest number of known occurrences of the vernal pool fairy shrimp are found in the Southeastern Sacramento Vernal Pool Region (see Service 2004), where it is found in scattered vernal pool habitats in Placer, Sacramento, and San Joaquin Counties, in the vicinity of Beale Air Force Base in Yuba County, and at a single location in El Dorado County.

Although the vernal pool crustaceans addressed in this biological opinion are not often found in the same vernal pool at the same time, when coexistence does occur, it is generally in deeper,

longer lived pools (Eng *et al.* 1990; Thiery 1991; Gallagher 1996). In larger pools, vernal pool crustacean species may be able to coexist by utilizing different physical portions of the vernal pool or by eating different food sources (Daborn 1978; Mura 1991; Hamer and Appleton 1991; Thiery 1991), or by hatching at different temperatures or developing at different rates (Thiery 1991; Hathaway and Simovich 1996).

The primary historic large-scale dispersal method for the vernal pool tadpole shrimp and vernal pool fairy shrimp likely was large scale flooding resulting from winter and spring rains which allowed colonization of different individual vernal pools and other vernal pool complexes (King 1996). This dispersal is currently non-functional due to the construction of dams, levees, and other flood control measures, and widespread urbanization within significant portions of the range of this species. Waterfowl and shorebirds may now be the primary dispersal agents for vernal pool tadpole shrimp and vernal pool fairy shrimp (King 1996; Simovich *et al.* 1992). The eggs of these branchiopods are either ingested (Krapu 1974; Swanson *et al.* 1974; Driver 1981; Ahl 1991) and/or adhere to the legs and feathers where they are transported to new habitats. Cysts may also be dispersed by a number of other species, such as cattle and humans (Eriksen and Belk 1999).

At the local level, vernal pool crustaceans are often dispersed from one pool to another through surface swales that connect one vernal pool to another. These dispersal events allow for genetic exchange between pools and create a population of animals that extends beyond the boundaries of a single pool. These dispersal events also allow vernal pool crustaceans to move into pools with a range of sizes and depths. In dry years, animals may only hatch in the largest and deepest pools. In wet years, animals may be present in all pools. The movement of vernal pool crustaceans into vernal pools of different sizes and depths allows these species to survive the environmental variability that is characteristic of their habitats.

The genetic characteristics of these species, as well as ecological conditions, such as watershed continuity, indicate that populations of vernal pool crustaceans are defined by pool complexes rather than by individual vernal pools (Fugate 1992). Therefore, the most accurate indication of the distribution and abundance of these species is the number of inhabited vernal pool complexes. The pools and, in some cases, pool complexes supporting these species may be small. Human-caused and unforeseen natural catastrophic events such as long-term drought, non-native predators, off-road vehicles, pollution, berming, and urban development, threaten their extirpation at some sites. Vernal pool fairy shrimp and vernal pool tadpole shrimp continue to be threatened by all of the factors which led to the original listing of this species, primarily habitat loss through agricultural conversion and urbanization (CNDDB 2004).

#### Vernal Pool Fairy Shrimp Critical Habitat

The Service designated approximately 1,184,513 acres of critical habitat for vernal pool crustaceans and vernal pool plants throughout California and southern Oregon on August 6, 2003 (68 FR 46683). Approximately 123,012 acres of proposed critical habitat for vernal pool species on State reserves, military lands, and national wildlife refuges were not included in the final designation (67 FR 59884; 68 FR 46683). Furthermore, approximately 721,452 acres of proposed critical habitat for vernal pool species located within the counties of Butte, Madera,

Merced, Sacramento, and Solano were excluded in the final designation. Thus, the Service, after excluding approximately 310,664 acres of proposed critical habitat for the vernal pool fairy shrimp, designated approximately 839,460 acres as critical habitat for the vernal pool fairy shrimp, consisting of 68 Critical Habitat units and subunits distributed from southern Oregon to southern California. Within Placer County, of the proposed 47,788 acres, approximately 32,134 acres were designated as critical habitat for the vernal pool fairy shrimp (Service 2003). Approximately 15,868 acres of Unit 12 are actual vernal pool grassland complexes containing the primary constituent elements for the listed vernal pool crustacean species (pers. comm., J. Wild, Sacramento Fish and Wildlife Office, 2005).

These designated critical habitat units for the vernal pool fairy shrimp contain primary constituent elements that support feeding, growth, breeding, reproduction, and dispersal. The first primary constituent element of vernal pool critical habitat is vernal pools, swales, and other ephemeral wetlands and depressions of appropriate sizes and depths that typically become inundated during winter rains and hold water for sufficient lengths of time necessary for incubation, reproduction, dispersal, feeding, and sheltering, but which are dry during the summer and do not necessarily fill with water every year. This primary constituent element provides the aquatic environment required for cyst incubation and hatching, growth and maturation, reproduction, feeding, sheltering, and dispersal, and the appropriate periods of dessication for cyst dormancy and to eliminate predators such as bullfrogs (*Rana catesbeiana*), fish, and other aquatic predators that depend on year round inundation of wetland habitats to survive.

The second primary constituent element is the geographic, topographic, and edaphic features that support aggregations or systems of hydrologically interconnected pools, swales, and other ephemeral wetlands and depressions within a matrix of surrounding uplands that together form hydrologically and ecologically functional units called vernal pool complexes. These features assist in the maintenance of the aquatic phase of the vernal pool habitat, by contributing to the filling and drying of the vernal pool, and maintaining suitable periods of pool inundation, water quality, and soil moisture for vernal pool crustacean hatching, growth and reproduction, and dispersal, but not necessarily every year. The entire vernal pool complex, including the pools, swales, and associated uplands, is essential to support the aquatic functions of the vernal pool habitat. Although the uplands are not actually occupied by vernal pool crustaceans, they nevertheless are essential to the conservation of vernal pool habitat and crustaceans because they maintain the aquatic phase of vernal pools and swales. Associated uplands also provide essential nutrients that form the basis of the vernal pool food chain, including a primary food source (e.g., algae, diatoms) for the vernal pool crustaceans. All of the above described primary constituent elements do not have to occur simultaneously within a unit for the unit to constitute critical habitat for one of these species.

The proposed project lies within the Western Placer County Unit (Unit 12) of critical habitat for the vernal pool fairy shrimp. This 32,134-acre critical habitat unit forms one of the remaining large vernal pool complex areas in the Southeastern Sacramento Valley Vernal Pool Region (Keeler-Wolf *et al.* 1998). This unit generally occurs in western Placer County, immediately north of the Sacramento County line, north of the City of Roseville, and northeast of the City of Rocklin (Service 2003). The northern boundary occurs just north of the City of Lincoln. This unit occurs mostly west of SR 65.

Unit 12 contains numerous occurrences of the vernal pool fairy shrimp (CNDDDB 2004) and is considered essential for the conservation of the species. Vernal pool fairy shrimp within this unit occur in both Northern Hardpan and Northern Volcanic Mudflow vernal pools as described by Sawyer and Keeler-Wolfe (1995). Unit 12 also contains vernal pool fairy shrimp found in vernal pools on Exchequer soils on the Mehrten geologic formation, a rare type of Northern Volcanic Mudflow vernal pool which has been reduced to only a few acres within Placer County (Service 2003). These pools are generally short-lived and do not provide habitat for most other species of fairy shrimp (CNDDDB 2004).

This unit contains 70 percent of the remaining vernal pool habitats in Placer County. Furthermore, this unit includes a large number of conservation areas established specifically to contribute to the recovery of vernal pool fairy shrimp. These protected areas include the Ahart Preserve and the Orchard Creek Conservation Bank. The Ahart Preserve is one of the few remaining examples of Northern Volcanic Mudflow vernal pools in the region (criterion 2). The 632.2-acre Orchard Creek Conservation Bank contains approximately 43.14 wetted acres of vernal pool crustacean habitat. Additional smaller preserves that protect vernal pool habitat in and around the cities of Lincoln and Roseville have also been established within this unit. All in all, approximately 20 percent of all habitat compensation areas established for the long-term protection of the vernal pool fairy shrimp is found in this unit. In addition, Placer County is currently developing a Habitat Conservation Plan (HCP) for the conservation of vernal pool fairy shrimp in this area; a 157-acre WRP easement for the protection of wetland resources occurs in this area.

The proposed alignment of the SR 65 Bypass project is located within the northern third of Unit 12, generally skirting along the perimeter of large, contiguous blocks of critical habitat (LSA 2004b). The proposed project action area, consisting of the project footprint and 250 feet or greater on either side of the footprint, includes approximately 519 acres of designated critical habitat for the vernal pool fairy shrimp, or 1.6 percent of Unit 12 (LSA 2004b). Approximately 47 percent of the proposed project alignment extends through or abuts designated critical habitat for the vernal pool fairy shrimp (LSA 2004b). Furthermore, 31.8 percent of proposed project's study area, which comprises approximately 5,122 acres encompassing the areas of and around six proposed alignments including the preferred alternative, consists of upland grasslands interspersed with Northern Hardpan and Northern Volcanic Mudflow vernal pool complexes (LSA 2004a), including vernal pools situated on the rare Exchequer soils of the Exchequer-Rock Outcrop Complex and the Inks-Exchequer Complex (LSA 2004a). The portions of Unit 12 located within the proposed project action area contain all of the constituent elements of vernal pool fairy shrimp critical habitat.

## **Environmental Baseline**

### **Valley Elderberry Longhorn Beetle**

When the beetle was listed as threatened in 1980, the species was known from less than ten localities along the American River, the Merced River, and Putah Creek. By the time the *Valley Elderberry Longhorn Beetle Recovery Plan* was issued in 1984, additional species localities had been found along the American River and Putah Creek. As of 2004, the California Natural

Diversity Data Base (CNDDDB) contains 215 occurrences of this species in 23 counties throughout the Central Valley, from a location along the Sacramento River in Shasta County southward to an area along Caliente Creek in Kern County (CNDDDB 2004). The beetle continues to be threatened by habitat loss and fragmentation, invasion by Argentine ants (*Linepithema humile*), and possibly other factors such as pesticide drift, exotic plant invasions, and grazing.

#### *Factors Affecting the Beetle within the Action Area*

**Habitat Loss:** Habitat loss has been ranked as the single greatest threat to biodiversity in the United States (Wilcove *et al.* 1998). In the final rule listing the beetle, habitat destruction was cited as the primary factor causing the decline of this animal (45 FR 52803). At the time the species was listed, its habitat had largely disappeared throughout much of its range due to agricultural conversion, levee construction, and stream channelization. The recovery plan reiterated that the primary threat to the beetle was loss and alteration of habitat by agricultural conversion, livestock overgrazing, levee construction, stream and river channelization, removal of riparian vegetation, riprapping of shoreline, plus recreational, industrial and urban development (Service 1984).

Some accounts state that the Sacramento Valley, as of 1848, supported approximately 775,000 to 800,000 acres of riparian forest (Smith 1977; Katibah 1984). Based on early soil maps, however, more than 921,000 acres of riparian habitat are believed to have been present throughout the Central Valley under pre-settlement conditions (Katibah 1984). Another source estimates that of approximately five million acres of wetlands in the Central Valley in the 1850s, approximately 1,600,000 acres were riparian wetlands (Warner and Hendrix 1985; Frayer *et al.* 1989).

Extensive destruction of California's Central Valley riparian forests has occurred during the last 150 years due to expansive agricultural and urban development (Katibah 1984; Smith 1977; Thompson 1961; Roberts *et al.* 1977). Since colonization, these forests have been "...modified with a rapidity and completeness matched in few parts of the United States" (Thompson 1961). As of 1849, the rivers and larger streams of the Central Valley were largely undisturbed. They supported continuous bands of riparian woodland four to five miles in width along some major drainages such as the lower Sacramento River, and generally about two miles wide along the lesser streams (Thompson 1961). Most of the riverine floodplains supported riparian vegetation to about the 100-year flood line (Katibah 1984). A large human population influx occurred after 1849, however, and much of the Central Valley riparian habitat was rapidly converted to agriculture and used as a source of wood for fuel and construction to serve a wide area (Thompson 1961). By as early as 1868, riparian woodland had been severely affected in the Central Valley, as evidenced by the following excerpt:

This fine growth of timber which once graced our river [Sacramento], tempered the atmosphere, and gave protection to the adjoining plains from the sweeping winds, has entirely disappeared - the woodchopper's axe has stripped the river farms of nearly all the hard wood timber, and the owners are now obliged to rely upon the growth of willows for firewood. (Cronise 1868 in Thompson 1961).

The clearing of riparian forests for fuel and construction made this land available for agriculture (Thompson 1961). Natural levees bordering the rivers, once supporting vast tracts of riparian habitat, became prime agricultural land (Thompson 1961). As agriculture expanded in the Central Valley, needs for increased water supply and flood protection spurred water development and reclamation projects. Artificial levees, river channelization, dam building, water diversion, and heavy groundwater pumping have further reduced riparian habitats to small, isolated fragments (Katibah 1984). In recent decades, these riparian areas have continued to decline as a result of ongoing agricultural conversion as well as urban development and stream channelization. As of 1989, there were over 100 dams within the Central Valley drainage basin, as well as thousands of miles of water delivery canals and stream bank flood control projects for irrigation, municipal and industrial water supplies, hydroelectric power, flood control, navigation, and recreation (Frayner *et al.* 1989). Riparian forests in the Central Valley have dwindled to discontinuous strips of widths currently measurable in yards rather than miles.

Between 1980 and 1995, the human population in the Central Valley grew by 50 percent, while the rest of California grew by 37 percent. The Central Valley's population was 4.7 million in 1999, and it is expected to more than double by 2040. The American Farmland Trust estimates that by 2040 more than one million cultivated acres will be lost and 2.5 million more put at risk (Ritter 2000). With this growing population in the Central Valley, increased development pressure is likely to result in continuing loss of riparian habitat.

Based on a CDFG riparian vegetation distribution map, only about 102,000 acres out of an estimated 922,000 acres of Central Valley riparian forest remain (Katibah 1984). This represents a decline in acreage of approximately 89 percent as of 1979 (Katibah 1984). More extreme figures were given by Frayer *et al.* (1989), who reported that approximately 85 percent of all wetland acreage in the Central Valley was lost before 1939; and that from 1939 to the mid-1980s, the acreage of wetlands dominated by forests and other woody vegetation declined from 65,400 acres to 34,600 acres. Differences in methodology may explain the differences between the studies. In any case, the historical loss of riparian habitat in the Central Valley strongly suggests that the range of the beetle has been reduced and its distribution greatly fragmented. Loss of non-riparian habitat where elderberry occurs (*e.g.* savanna and grassland adjacent to riparian areas, oak woodland, mixed chaparral-woodland), and where the beetle has been recorded (Barr 1991), suggests further reduction of the beetle's range and increased fragmentation of its upland habitat.

A number of studies have focused on riparian habitat loss along the Sacramento River, which supports some of the densest known populations of the beetle. Approximately 98 percent of the middle Sacramento River's historic riparian vegetation was believed to have been extirpated by 1977 (DWR 1979). The State Department of Water Resources estimated that native riparian habitat along the Sacramento River from Redding to Colusa decreased 34 percent from 27,720 acres to 18,360 acres between 1952 and 1972 (McGill 1975; Conrad *et al.* 1977). The average rate of riparian loss on the middle Sacramento River was 430 acres per year from 1952 to 1972, and 410 acres per year from 1972 to 1977. In 1987, riparian areas as large as 180 acres were observed converted to orchards along this river (McCarten and Patterson 1987). There is no comparable information on the historic loss of non-riparian beetle habitat, such as elderberry savanna and other vegetation communities where elderberry occurs, including oak or mix-

chaparral woodland, or grasslands adjacent to riparian habitat. All natural habitats throughout the Central Valley, however, have been heavily impacted within the last 200 years (Thompson 1961), and it can, therefore, be assumed that non-riparian beetle habitat also has suffered a widespread decline.

**Habitat Fragmentation:** While habitat loss is clearly a large factor leading to the species' decline, other factors are likely to pose significant threats to the long-term survival of the beetle. Approximately nine percent of 79 Central Valley sites that supported beetle habitat in 1991 no longer supported beetle habitat in 1997 (Barr 1991). Only approximately 20 percent of riparian sites with elderberry observed by Barr (1991) and Collinge *et al.* (2001) were found to support beetle populations. The fact that a large percentage of apparently suitable habitat is unoccupied suggests that the beetle is limited by factors other than habitat availability, such as habitat quality or limited dispersal ability. The beetle is patchily distributed throughout the remaining riparian habitat of the Central Valley from Redding to Bakersfield.

Destruction of riparian habitat in central California has resulted not only in a loss of acreage, but also in habitat fragmentation. Habitat fragmentation can be an important factor contributing to species declines because (1) it divides a large population into two or more small populations that become more vulnerable to direct loss, inbreeding depression, genetic drift, and other problems associated with small populations, (2) it limits a species' potential for dispersal and colonization, and (3) it makes habitat more vulnerable to outside influences by increasing the edge-to-interior ratio (Primack 1998).

Barr (1991) found that small isolated habitat remnants were less likely to be occupied by beetles than larger patches, indicating that beetle subpopulations are extirpated from small habitat fragments. Barr (1991) and Collinge *et al.* (2001) consistently found beetle exit holes occurring in clumps of elderberry bushes rather than isolated bushes, suggesting that isolated shrubs do not typically provide long-term viable habitat for this species. The beetle appears to be only locally common, *i.e.*, found in population clusters which are not evenly distributed across available elderberry shrubs. Plants used by the beetle usually show evidence of repeated use over a period of several years, but sometimes only one or two exit holes are present. Similar observations on the clustered distributions of exit holes were made by Jones and Stokes (1988). Barr (1991) noted that elderberry shrubs and trees with many exit holes were most often large, mature plants; young stands contained exit holes.

The beetle, a specialist on elderberry plants, tends to have small population sizes and to occur in low densities (Barr 1991; Collinge *et al.* 2001; Service 1984), and studies suggest that the beetle is unable to re-colonize drainages where the species has been extirpated because of its limited dispersal ability (Huxel 2000; Barr 1991; Collinge *et al.* 2001). Low density and limited dispersal capability cause the beetle to be vulnerable to the negative effects of the isolation of small subpopulations due to habitat fragmentation. With extensive riparian habitat loss and fragmentation, these naturally-small beetle populations are broken into even smaller and more isolated populations. Once a small beetle population has been extirpated from an isolated habitat patch, the species may be unable to re-colonize this patch if it is unable to disperse from nearby occupied habitat. Insects with limited dispersal and colonization abilities may persist better in large habitat patches than small patches because small fragments may be insufficient to maintain

viable populations and the insects may be unable to disperse to more suitable habitat (Collinge 1996). Recent research indicates that isolated habitats unoccupied by the beetle remain so (Barr 1991; Collinge *et al.* 2001).

Species that characteristically have small population sizes, such as habitat specialists, are more likely to become extinct than species that typically have large populations (Primack 1998), and populations of species that naturally occur at lower density become extinct more rapidly than do those of more abundant species (Bolger *et al.* 1991). Small, isolated subpopulations are susceptible to extirpation from random demographic, environmental, and/or genetic events (Shaffer 1981; Lande 1988; Primack 1998). While a large area may support a single large population, the smaller subpopulations that result from habitat fragmentation may not be large enough to persist over a long time period. As a population becomes smaller, it tends to lose genetic variability through genetic drift, leading to inbreeding depression and a lack of adaptive flexibility. Smaller populations also become more vulnerable to random fluctuations in reproductive and mortality rates, and are more likely to be extirpated by random environmental factors.

Habitat fragmentation not only isolates small populations, but also increases the interface between habitat and urban or agricultural land, increasing negative edge effects such as the invasion of non-native species (*e.g.* the Argentine ant; see Huxel 2000), pesticide contamination (Barr 1991), and livestock grazing (Service 1984). These threats are described in further detail below.

**Invasive Species:** Recent evidence indicates that the invasive Argentine ant poses a risk to the long-term survival of the beetle. Surveys along Putah Creek found beetle presence where Argentine ants were not present or had only recently colonized, and beetle absence from otherwise suitable sites where the ants had become established (Huxel 2000). The Argentine ant has negatively affected populations of other native arthropod species (Holway 1995; Ward 1987). Predation on eggs, larvae, and pupae are the most likely impacts these ants have on the beetle. In Portugal, Argentine ants have been found to be significant egg predators on the eucalyptus borer (*Phorocantha semipunctata*), another cerambycid like the beetle. Egg predation on the beetle could lead to local extirpations, as indicated by a population viability study that suggested that egg and juvenile mortality are significant factors affecting the probability of extinction for the beetle (Huxel and Collinge, in prep.). The Argentine ant has been expanding its range throughout California since its introduction in 1907, especially in riparian woodlands associated with perennial streams (Holway 1995; Ward 1987). Huxel (2000) felt that with the potential for Argentine ants to spread with the aid of human activities, such as movement of plant nursery stock and agricultural products, this species may come to infest most drainages in the Central Valley along the valley floor inhabited by the beetle.

Competition from invasive exotic plants, such as giant reed (*Arundo donax*), negatively affects riparian habitat supporting the beetle. Giant reed, a native of Asia, has become a serious problem in California riparian habitats, forming dense, homogenous stands essentially devoid of wildlife (Rieger and Kreager 1989). This species grows up to 2.5 inches per day and yields 8.3 tons of oven-dry cane per acre (Rieger and Kreager 1989, Perdue 1958). It can tolerate drought, floods, and extreme temperatures, and is not significantly affected by insects, disease,



herbivory, fire, or mechanical disturbance. It has an extensive root system allowing it to resprout rapidly after any disturbance and out-compete native riparian vegetation. Giant reed also introduces a more frequent fire cycle into the riparian ecosystem, disrupting natural riparian dynamics and eventually forming homogenous climax communities. The extent to which giant reed has affected elderberry shrubs and the beetle specifically, however, has not been studied.

**Pesticide Contamination:** Direct spraying and drift of pesticide, including herbicides and/or insecticides, in or near riparian areas (which is done to control mosquitoes, crop diseases, invasive and/or undesirable plants, or other pests) is likely to adversely affect the beetle and its habitat. Although there have been no studies specifically focusing on the effects of pesticides on the beetle, the species is likely to be affected by these agents. As of 1980, the prevalent land use adjacent to riparian habitat in the Sacramento Valley was agriculture, even in regions where agriculture was not generally the most common land use (Katibah 1984); therefore, the species is likely vulnerable to pesticide contamination from adjacent agricultural practices. Recent studies of major rivers and streams documented that 96 percent of all fish, 100 percent of all surface water samples, and 33 percent of major aquifers contained one or more pesticides at detectable levels (Gilliom 1999). Pesticides were identified as one of the 15 leading causes of impairment for streams included in the section 303(d) lists of impaired waters of the Federal Water Pollution Control Act, as amended (Clean Water Act). As the beetle occurs primarily in riparian habitat, the contamination of rivers and streams affects this species and its habitat. Pesticides have been identified as one of a number of potential causes of the decline of both pollinator species declines and other insects beneficial to agriculture (Ingraham *et al.* 1996); therefore, it is likely that the beetle, typically occurring adjacent to agricultural lands, has suffered a similar decline due to pesticides.

**Livestock Grazing:** Livestock grazing damages or destroys elderberry plants and inhibits regeneration of seedlings. Cattle readily forage on new elderberry growth, which may explain the absence of beetles at manicured elderberry stands (Service 1984). Habitat fragmentation exacerbates problems related to exotic species invasion and livestock overgrazing by increasing the edge to interior ratio of habitat patches, facilitating penetration of these influences.

To summarize, the Service believes that the beetle, though relatively wide-ranging, is in long-term decline due to widespread alteration and fragmentation of its riparian habitats, and to a lesser extent, its upland habitats, by human activities. Long-term protection of habitat for the beetle would be provided by the creation and protection of conservation areas and the implementation of various protective measures.

There are seven records for the beetle in Placer County and in the vicinity of the proposed project (CNDDDB 2004). The CNDDDB identifies beetle locality records from the Bear River, just north of the proposed project site, and from Roseville and Rocklin, approximately 10 miles south of the proposed project site (2004). Therefore, based on the distribution of the beetle, its ecology and biology, the presence of suitable habitat in the action area in the form of elderberry shrubs, as well as the recent records, the Service believes it is reasonably certain that the beetle inhabits the proposed project site.

### Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp

The vernal pool tadpole shrimp and vernal pool fairy shrimp are imperiled by a variety of human-caused activities. Their habitats have been lost through direct destruction and modification due to filling, grading, disking, leveling, and other activities. In addition, vernal pools have been imperiled by a variety of anthropogenic modifications to upland habitats and watersheds. These activities, primarily urban development, water supply/flood control projects, land conversion for agriculture, off-road vehicle use, certain mosquito abatement measures, and pesticide/herbicide use can lead to disturbance of natural flood regimes, changes in water table depth, alterations of the timing and duration of vernal pool inundation, introduction of non-native plants and animals, and water pollution. These can result in adverse effects to vernal pool species.

In addition to direct loss, the habitats of the vernal pool tadpole shrimp and the vernal pool fairy shrimp have been and continue to be highly fragmented throughout their ranges due to conversion of natural habitat for urban and agricultural uses. Fragmentation results in smaller isolated shrimp populations. Ecological theory predicts that such populations will be highly susceptible to extirpation due to chance events, inbreeding depression, or additional environmental disturbance (Gilpin and Soulé 1988; Goodman 1987a, 1987b). If an extirpation event occurs in a population that has been fragmented, the opportunities for re-colonization would be greatly reduced due to geographic isolation from other source populations.

Historically, vernal pools and vernal pool complexes occurred extensively throughout the Sacramento Valley of California. Conversion of vernal pools and vernal pool complexes, however, has resulted in a 91 percent loss of vernal pool resources in California (California Office of Planning and Research 2003). By 1973, between 60 and 85 percent of the area within the Central Valley that once supported vernal pools had been destroyed (Holland 1978). In subsequent years, threats to this habitat type have continued and resulted in a substantial amount of vernal pool habitat being converted for human uses in spite of Federal regulations implemented to protect wetlands. The Corps' Sacramento District has several thousand vernal pools under its jurisdiction (Coe 1988), which includes most of the known populations of these listed species. Between 1987 and 1992, 467 acres of wetlands within the Sacramento area were filled pursuant to the Corps' Nationwide Permit 26 (Service 1992). A majority of those wetlands losses involved vernal pools, the endemic habitat of the vernal pool tadpole shrimp and the vernal pool fairy shrimp. King (1998) has estimated that approximately 15 to 33 percent of the original biodiversity of Central Valley vernal pool crustaceans has been lost since the 1800s. It is estimated that within 20 years human activities will destroy 60 to 70 percent of the remaining vernal pools (Coe 1988). Of the several thousand vernal pools that are located around Sacramento, Coe (1988) suggested that perhaps 1,800 vernal pools will be adversely affected due to future development in western Placer County alone.

Western Placer County is located in the Southeastern Sacramento Vernal Pool Region, one of 17 vernal pool regions in the State of California defined by the CDFG in the California Vernal Pool Assessment Preliminary Report (Keeler-Wolf *et al.* 1998; Service 2004). The regions were identified according to biological, geomorphological, and soils information. The Southeastern Sacramento Valley Vernal Pool Region contains almost 15 percent of the remaining vernal pool

grasslands in the State, and it supports 35 percent of the known occurrences of the vernal pool fairy shrimp. It is the most threatened by development of the 17 regions. According to Holland (1998), Placer County has lost 1,525 acres of vernal pool habitat from 1994 to 1997, at a rate of approximately 508 acres per year, or just over 1 percent per year. In this vernal pool region, both the vernal pool fairy shrimp and the vernal pool tadpole shrimp are threatened by urban development, and also by lack of management and monitoring on mitigation sites and other protected lands where these species are known to occur (Service 2004).

Throughout the Central Valley, approximately 13,000 acres of vernal pool habitats, including mitigation banks, have been set aside for the vernal pool fairy shrimp specifically as terms and conditions of section 7 consultations (Service 2004). In the Southeastern Sacramento Valley Vernal Pool Region, vernal pool fairy shrimp occurrences are protected from development at a number of private mitigation areas, mitigation banks, private ranches with conservation easements, and the Beale Air Force Base in Yuba County. Very few actions have been taken specifically to benefit the vernal pool tadpole shrimp, although several Habitat Conservation Plans are developing vernal pool preserve plans in the region, including Sacramento and Placer Counties (Service 2004).

Nonetheless, human population growth in Placer County continues to steadily increase, particularly in the communities of Roseville and Lincoln, thereby threatening extant occurrences of listed vernal pool crustaceans. The City of Lincoln is projected to have a population of 62,414 in 2025, up from 16,154 in the year 2000 (Caltrans 2003). The fastest growing housing markets in the Sacramento metropolitan region include the communities of Lincoln and Roseville. Population growth in the City of Lincoln has corresponded to the growth of housing, which increased from 3,359 housing units in 1999 to 6,766 housing units in 2002; the Sun City Lincoln Hills development was a significant contributor to this population and housing surge, adding approximately 2,800 homes with an additional 3,800 homes yet to be built (Caltrans 2003). Housing units in the City of Lincoln are expected continue to increase by 26 percent over the next 20 years, from approximately 6,541 units in 2003 to approximately 24,964 units in 2025 (Caltrans 2003). It is anticipated that job growth will increase 40 percent between 2000 and 2025 in the suburban areas of the Sacramento metropolitan region, including Lincoln and Roseville, thereby increasing the demand upon transportation infrastructure (Caltrans 2003).

A number of State, local, private, and unrelated Federal actions have occurred within the project area and adjacent region affecting the environmental baseline of these species. Some of these projects have been subject to section 7 consultation. The Service has issued 106 biological opinions on proposed projects in Placer County that have adversely affected one or both of these shrimp species since they were listed in 1994. This total does not reflect the formal consultations that were amended. These projects in Placer County actions have resulted in both direct and indirect affects to vernal pools within the region, and have contributed to the loss of vernal pool tadpole shrimp and vernal pool fairy shrimp populations. Although these projects in Placer County have eliminated vernal pools and vernal pool complexes, the offsetting compensating measures are designed to minimize the effects of take of listed vernal pool crustaceans resulting in both negative and positive effects to these species. Although a reduction of the two shrimp populations has not been quantified, the acreage of lost habitat continues to grow.

The proposed project is underlain by terrace and alluvial bottom soils typical of western Placer County. Twelve soil types are mapped within the proposed action area (USDA-SCS 1980). These include the Cometa-Fiddymment complex, the Cometa-Ramona sandy loams, the Fiddymment-Kaseberg loams, the Kilaga loam, the Ramona sandy loam, the San Joaquin and San Joaquin-Cometa sandy loams, the Exchequer-Rock outcrop complex, and the Inks-Exchequer complex, all of which may support vernal pools and vernal swales. The vernal pools situated on Exchequer soils on the Mehrten geologic formation, a rare type of Northern Volcanic Mudflow vernal pool which has been reduced to only a few acres within Placer County, are also biologically unique and rare (Service 2003). The Mehrten geologic formation and its associated soils are found along portions of the proposed project alignment. This formation is characterized by eroded, high-standing remnants of fans from volcanic mud and lava flows. Along the distal edges of this geologic formation are flatter areas that commonly contain a disjunct network of vernal pools and swales (Smith and Verrill 1998). This geographically-restricted geological formation and biological habitat has nearly been eliminated in western Placer County. Because of the rarity of the Mehrten geologic formation in western Placer County and the possibility of unique adaptations that vernal pool species may have in the associated vernal pools, this geologic formation is biologically important.

Western Placer County represents important, high quality habitat for the two shrimp populations by providing large, nearly contiguous areas of relatively undisturbed vernal pool habitat. Although Placer County has relatively few documented occurrences of vernal pool tadpole shrimp within the range of the species as compared to other counties, it contains the third greatest number of occurrences of vernal pool fairy shrimp within the range of the species. Placer County contains 37 (11 percent) out of the total of 347 reported occurrences of vernal pool fairy shrimp, and 2 (1 percent) out of the total of 174 reported occurrences of vernal pool tadpole shrimp (CNDDB 2004). Further, Sugnet and Associates (1993) reported that of the 3,092 "discrete populations" checked, 178 locations (6 percent) were found to support the vernal pool fairy shrimp. Of this total, 42 locations (24 percent) were within Placer County. Of the 3,092 locations checked, only 345 locations, or about 11 percent of all locations checked, were found to support the vernal pool tadpole shrimp. Of these 345 locations supporting the vernal pool tadpole shrimp, only 1 (less than one percent) was in Placer County.

The proposed action area was surveyed for the presence of listed vernal pool crustaceans as a part of the Natural Environment Study (Beak 1991; Caltrans 1994; LSA 2000). These surveys found vernal pool fairy shrimp throughout all the proposed alignments, including the preferred alignment for the proposed project. There are records for vernal pool tadpole shrimp in the immediate vicinity of the proposed project (LSA 1999), including one record at the U.S. Air Force's Lincoln Communications Facility, located approximately four miles southwest of the proposed project alignment (CNDDB 2004). Consequently, it is inferred that vernal pool tadpole shrimp occur in suitable habitat throughout the proposed project action area (LSA 1999, 2004a). The Service believes that the vernal pool tadpole shrimp is reasonably certain to occur within the action area because of the biology and ecology of the animal, the presence of suitable habitat in and adjacent to the action area, as well as the recent observations of this listed species.

Vernal Pool Fairy Shrimp Critical Habitat

Approximately 32,134 acres of the designated 32,230-acre critical habitat Unit 12 (for the vernal pool fairy shrimp) are located in Placer County (Service 2003). Unit 12 contains 70 percent of the remaining vernal pool habitat in Placer County (Service 2003). This unit has been identified as one of the outstanding vernal pool sites remaining in the Sacramento Valley (Service 2003). Vernal pool fairy shrimp within Unit 12 occur in both Northern Hardpan and Northern Volcanic Mudflow vernal pools (Service 2003; Sawyer and Keeler-Wolfe 1995), but also in vernal pools on Exchequer soils on the Mehrten geologic formation, a rare type of Northern Volcanic Mudflow vernal pool which has been reduced to only a few acres within Placer County (Service 2003). Unit 12 occurs mostly west of SR 65, and consists two primary portions: 1) a larger contiguous block extending southerly and southwesterly from the southern limits of the City of Lincoln to the Sacramento County border and 2) a smaller contiguous block extending northerly and northwesterly from the northeastern limits of the City of Lincoln to Coon Creek. The proposed project would bisect several distinct vernal pool complexes within the northern block of Unit 12.

A number of State, local, private, and unrelated Federal actions have occurred within the project area and adjacent region affecting the designated critical habitat of the vernal pool fairy shrimp. Some of these projects have been subject to prior section 7 consultation. The Service has issued five biological opinions to Federal agencies on proposed projects in California that have affected the critical habitat of the vernal pool fairy shrimp since it was designated in 2003. The Service is currently consulting on six additional proposed projects, including this one and another in Placer County, which may adversely modify designated critical habitat for the vernal pool fairy shrimp.

Development projects completed within western Placer County and critical habitat Unit 12 for the vernal pool fairy shrimp include the Highland Reserve, Highland Reserve North, Sunset West, Stanford Ranch, Twelve Bridges, Sun City Lincoln Hills, and Stoneridge Specific Plan Area (e.g., Olympus Oaks and Cavitt Ranch projects). General and Specific Plans for the western Placer County area are currently being prepared and/or evaluated, such as the proposed Placer Vineyards, Antonio Mountain Ranch, Three-D South, Whispering Springs, Placer Parkway, Lincoln Crossing, Aitken Ranch, Sundance, and Nader property. In addition, we are aware of other proposed housing, industrial, infrastructure, energy facilities, universities, hospitals, and other development projects in and around the cities of Lincoln, Rocklin, Roseville and in Placer County.

Portions of Unit 12 include the City of Lincoln, which in recent years has experienced a rapid rate of growth, particular in the southern portion of the City. In the area south of Lincoln Airport, approximately 521 acres of designated critical habitat in Unit 12 has already been developed (LSA 2004b). The City of Lincoln is currently updating its General Plan. Three alternatives are being considered that propose varying degrees of additional growth around the current city limits. Depending on the alternative selected, between 2,200 and 3,700 acres of additional critical habitat in Unit 12 could be lost to development (LSA 2004b).

The southeastern boundary of Unit 12 abuts the western limit of the City of Roseville. The Service recently issued a biological opinion on the proposed 3,162-acre West Roseville Specific Plan that would allow for a mixed-use development consisting of residential, commercial, industrial, and open space uses to the west of the current city boundary; this area would be annexed into the City (LSA 2004b). The City is currently reviewing a separate but related Sphere of Influence adjustment that includes an additional 2,378 acres in this area. The total area of 5,540 acres is almost entirely within Unit 12 (LSA 2004b).

These completed and proposed projects have resulted in or will likely result in significant, unavoidable effects to biological communities. These effects include the elimination of vernal pools, intermittent drainages and other seasonal wetlands, the reduction of the number of vernal pool complexes within the area, all of which result in both direct and indirect effects to vernal pools, and contributes to the loss of vernal pool fairy shrimp and vernal pool tadpole shrimp occurrences. Despite these effects, we assume that city and county governments will continue to approve development projects within the area. According to one study, the combination of recent and proposed development in the cities of Lincoln and Roseville may eventually eliminate up to 9,768 acres, or approximately 31 percent, of the designated Critical Habitat Unit 12 for the vernal pool fairy shrimp (LSA 2004b). According to a Service analysis of various development scenarios proposed in General and Specific Plans for the western Placer County area, however, the loss of vernal pool grasslands in western Placer County and Critical Habitat Unit 12 could actually approach 70 percent (pers. comm., J. Wild, Sacramento Fish and Wildlife Office, 2005).

In summary, the condition of Critical Habitat Unit 12 retains the primary constituent elements that resulted in its designation. The high density and contiguous arrangement of vernal pool complexes within Unit 12 indicate the relatively high quality and functionality of vernal pool habitat within this unit. This condition of Unit 12, however, is threatened by habitat fragmentation and degradation resulting from ongoing development within Placer County. The proposed project will contribute towards this fragmentation and degradation of Unit 12.

The proposed project will affect approximately 40.713 wetted acres of vernal pool fairy shrimp Critical Habitat Unit 12, including approximately 23.589 wetted acres directly and 17.124 wetted acres indirectly. In addition, approximately 206 acres of contributing uplands associated with vernal pools and vernal swales within critical habitat Unit 12 will be similarly affected (LSA 2004b). This accounts for 1.6 percent of the total Unit 12 acreage, as originally designated. If the loss of designated critical habitat resulting from the recent and projected growth of the cities of Lincoln and Roseville is evaluated, then the proposed project will affect approximately 2.3 percent of the remaining portion of designated Critical Habitat Unit 12 for the vernal pool fairy shrimp (LSA 2004b). The proposed project will effectively bisect several distinct vernal pool complexes within the northern block of Unit 12, contributing to the on-going fragmentation of Unit 12.

## Effects of the Proposed Action

### Direct Effects

Direct effects are the immediate effects of the proposed project on the species or its habitat and include the effects of interrelated action and interdependent actions. Interrelated actions are those actions that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those actions that have not independent utility apart from the proposed action (50 CFR §402.02).

#### *Valley Elderberry Longhorn Beetle*

The proposed action is likely to adversely affect the beetle by removing 2 elderberry shrubs located within 20 feet of the centerline of the project's proposed alignment. The shrubs are located in the riparian habitat and, in total, have 10 stems greater than one inch in diameter at ground level. None of these shrubs contain beetle exit holes. Transplantation of 2 shrubs will temporarily reduce the amount of habitat available to the beetle, and may harm any beetle larvae which may presently be developing within the plants.

#### *Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp*

Although vernal pool fairy shrimp and vernal pool tadpole shrimp exhibit slightly differing habitat requirements and life cycles, they often inhabit the same vernal pool complexes and have been known to co-occur in individual vernal pools. These species are supported by similar habitat types, including vernal pools, seasonally ponded areas within vernal swales, rock outcrop ephemeral pools, playas, alkali flats, and other depressions that hold water of similar volume, depth, area, and duration. Therefore, both species are subject to a common set of threats and considerations.

Surveys identified the presence of vernal pool fairy shrimp within the action area of the proposed project (Beak 1991; Caltrans 1994). There are records for vernal pool tadpole shrimp in the immediate vicinity of the proposed project (LSA 1999; CNDDDB 2004). Consequently, it is assumed that vernal pool tadpole shrimp occur in suitable habitat throughout the proposed project action area (LSA 1999, 2004a). All of the vernal pools and seasonal wetlands on the proposed project site, however, provide appropriate habitat for both vernal pool fairy shrimp and vernal pool tadpole shrimp. Because these species are known from the within the proposed project's action area and/or the immediate vicinity, and it is likely the vernal pool crustaceans would disperse within the watershed between the project sites, the applicant assumes presence of vernal pool fairy shrimp and vernal pool tadpole shrimp in all suitable habitat on the proposed project site. Therefore, construction of the proposed project in any portion of the proposed project site that supports suitable habitat is likely to adversely affect populations of vernal pool fairy shrimp and vernal pool tadpole shrimp.

The proposed project would result in direct effects to 26.941 wetted acres of vernal pool crustacean habitat, including 23.589 wetted acres of designated critical habitat for the vernal pool fairy shrimp. An entire vernal pool or seasonal wetland will be directly affected even when only

a portion of it is filled or subject to similar direct affects because this may result in a an alteration to the hydrology of the vernal pool/seasonal wetland and/or increased sedimentation (see Adamus *et al.* 2001; Sheldon *et al.* 2003).

#### *Vernal Pool Fairy Shrimp Critical Habitat*

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force v. U.S. Fish and Wildlife Service* (No. 03-35279) to complete the following analysis with respect to critical habitat.

The direct effects to the species, described above, similarly affect vernal pool fairy shrimp designated critical habitat and its primary constituent elements (*i.e.*, habitat components that are essential for the primary biological needs of the species). Of the 26.941 wetted acres of vernal pool crustacean habitat that would be directly affected by the proposed project, approximately 23.589 wetted acres of this is designated critical habitat for the vernal pool fairy shrimp (*i.e.*, Unit 12). Due to the nature of the proposed project, most of the direct affects to critical habitat are permanent and will occur at the time of project construction which will extend over a period of two to four years. Many of the vernal pools and vernal swales within the proposed project footprint will be graded and filled, others will be affected by the construction of drainage facilities, installation of fencing, and/or landscaping (LSA 2004b). Approximately 206 acres of contributing uplands associated with vernal pools and vernal swales within critical habitat Unit 12 will be similarly affected (LSA 2004b).

#### Interrelated and Interdependent Actions

Additional effects from interrelated and interdependent actions are expected from the proposed project. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no significant independent utility apart from the proposed action.

Continuing development in western Placer County, and particularly in the City of Lincoln, and the expansion of planned growth that is facilitated by the implementation of the proposed project will require the extension of utilities and the enlargement of roads in areas adjacent to and surrounding the proposed project's action area. Utility improvements may include the development of a well field, water supply lines, and water treatment facilities and sewer lines. These future projects may adversely affect several federally-listed species, some of which may occur outside of the action area for the proposed project, including the vernal pool crustaceans, beetle, the California red-legged frog (*Rana aurora draytonii*), the slender Orcutt grass, and designated critical habitat for the vernal pool fairy shrimp.

The development and urbanization of western Placer County has resulted in the destruction of seasonal wetlands and the loss of habitat for listed vernal pool crustaceans. Urbanization has also resulted in the channelization and degradation of creeks and riparian areas in the region, which may contain elderberry shrubs, potential habitat for the beetle. This development has



resulted in the conversion of habitat for listed vernal pool crustaceans and the beetle to incompatible uses. Additional effects include degradation of water quality, increased pollutant run-off, and habitat fragmentation.

### Indirect Effects

Indirect effects are caused by or result from the proposed action, are later in time, and are reasonably certain to occur. Indirect effects may occur outside of the area directly affected by the action (50 CFR §402.02).

The purpose of the proposed action is to alleviate the associated increase of vehicular traffic resulting from current and projected increases in human population in the region. Because the existing transportation network, which has less capacity than the network associated with the proposed action, would limit the development potential of the area, it is likely that the implementation of the proposed project will facilitate the development of privately owned lands adjacent to and in the vicinity of the proposed project, resulting in indirect effects to listed species and habitat.

Although the proposed project may change the pattern of growth in the area, much of the growth that would occur in the vicinity of the proposed action area can be determined by reviewing plans of the City of Lincoln and Placer County, obtaining information on projected growth, recent development patterns, discussions with City and County personnel, and the policies currently implemented in the proposed project area (Caltrans 2003). Planned growth is occurring in the proposed project area, and the proposed project may accelerate some of this planned growth. Growth is likely to occur along the new highway corridor and particularly at the locations of proposed new interchanges, as stated in the *Route 65 Lincoln Bypass Natural Environment Study Report* (LSA 1999): "Given the project's proximity to the City of Lincoln, and the growth anticipated for the Lincoln area, it is reasonable to expect that the [proposed] Route 65 project may facilitate additional development at these interchange locations beyond what would be expected to occur without the bypass project." Studies have shown that development will likely occur when new roads allow access to land previously inaccessible and the area is prime for development (Caltrans 2003). In evaluating indirect effects, a four mile circle was drawn around each of the proposed intersections/interchanges associated with the proposed project. These circles are considered to be potential influence areas from both the proposed project and development patterns already occurring in the area (Caltrans 2003).

The proposed intersections at Industrial Avenue, Nelson Lane, Wise Road, and Riosa Road are each expected to be eventually upgraded to interchanges (Caltrans 2003). These interchanges would accommodate heavy volumes of traffic that are expected in the area, serving the residents of the Twelve Bridges and Lincoln Crossing subdivisions, commuters and inter-regional travelers, providing access to the Lincoln Regional Airport and the industrial area adjacent to the Airport, and serving the community of Sheridan (Caltrans 2003). Much of the land surrounding these proposed interchanges is zoned for residential development, industrial uses, and agriculture (Caltrans 2003). Although it is the City of Lincoln's policy is to ensure that agriculture will continue to be a significant land use within the City, it can be expected that the agricultural areas would be under increased pressure to develop when access is provided and the roads are

improved (Caltrans 2003). Development companies, not farmers or ranchers, however, own agriculturally-zoned land near the proposed intersections/interchanges and most of the investment properties are within the area that is projected for annexation into the City of Lincoln (Caltrans 2003).

The majority of vernal pool complexes, including approximately 1,480 acres of vernal pool grasslands, within the proposed project's action area (*i.e.*, within the four mile circles surrounding the proposed intersections/interchanges), are located around the proposed Wise Road intersection/interchange (Caltrans 2003). Approximately 2,124 total acres of vernal pool grasslands are located around the other three proposed interchanges (Caltrans 2003). Caltrans has worked in coordination with Placer Legacy and EPA to develop an avoidance strategy to conserve the Coon Creek corridor by including acquisition of conservation parcels that will both keep the Coon Creek corridor intact and minimize facilitated planned growth around the proposed Wise Road intersection/interchange (Caltrans 2003).

The City of Lincoln is one of the fastest growing areas in the State of California and is accommodating this growth with plans and policies. The City of Lincoln has proposals to expand the Airport, construct a new wastewater treatment and reclamation facility to serve both current customers and expected residents of the new subdivisions, and carry out local road improvements to accommodate the expected growth under the City's new general plan (Caltrans 2003). The area between the City of Lincoln and the proposed bypass is expected to be developed within the general plan horizon (Caltrans 2003). This growth has occurred in spite of the transportation infrastructure not keeping pace with the need (Caltrans 2003). Since the details for much of the development that is facilitated by this project has not been provided, the Service has not fully evaluated or analyzed future affects. Therefore, this biological opinion will not cover in our incidental take statement these affects.

#### *Valley Elderberry Longhorn Beetle*

Since there are no other elderberry shrubs located within the proposed project's alignment, there will be no indirect effects to the beetle.

#### *Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp*

Indirect effects to vernal pools in the project vicinity that could result from the implementation of the proposed project include hydrologic alteration, habitat fragmentation, disturbances from construction equipment, non-point source pollution, and impacts from human encroachment. All vernal pool crustacean habitats within 250 feet of proposed construction activities will be indirectly affected by project implementation. The habitat located more than 250 feet outside of proposed construction activities also could be indirectly affected if it is part of and contiguous to habitat affected.

The draft MMP (LSA 2004c) determined, based on a "watershed analysis", that 13.56 wetted acres of vernal pool crustacean habitat would be indirectly affected by the proposed project (see page 40, LSA 2004c). An analytical approach utilized by the Service indicates otherwise. The Service asserts that vernal pool habitats within 250 feet of the project footprint, plus any

additional vernal pools that are hydrologically interconnected or within the vernal pool complex, will be indirectly affected by construction activities. Thus, it is the Service's opinion that the proposed project could result in indirect effects to a total of 20.957 wetted acres of suitable vernal pool crustacean habitat, including 17.124 wetted acres of designated critical habitat for the vernal pool fairy shrimp. These features will be indirectly affected by construction activities occurring within 250 feet of them. Individual crustaceans and their cysts, which may inhabit these vernal pools and seasonal wetlands, may be injured or killed by any of the following indirect effects:

**Erosion:** The ground disturbing activities in the watershed of vernal pools associated with the proposed project action area are expected to result in siltation when pools fill during the wet season following construction. Siltation in pools supporting listed crustaceans may result in decreased cyst viability, decreased hatching success, and decreased survivorship among early life history stages, thereby reducing the number of mature adults in future wet seasons. The proposed project construction activities could result in increased sedimentation transport into vernal pool crustacean habitats during periods of heavy rains.

**Changes in hydrology:** The biota of vernal pools and swales can change when the hydrologic regime is altered (Bauder 1986, 1987). Survival of aquatic organisms like the vernal pool fairy shrimp and vernal pool tadpole shrimp are directly linked to the water regime of their habitat (Zedler 1987). Construction activities may alter a pool's hydro-period by blocking or impairing surface and subsurface flows or by damaging the impervious subsoil layer, for instance, through excavation or compaction of the subsurface strata, in the vicinity of the vernal pool. Therefore, construction near vernal pool areas will, at times, result in the decline of local sub-populations of vernal pool organisms, including fairy shrimp and tadpole shrimp.

**Introduction of non-natives:** There is an increased risk of introducing weedy, non-native plants into the vernal pools both during and after project construction due to the soil disturbance from clearing and grubbing operations, and general vegetation disturbance associated with the use of heavy equipment.

**Human intrusion and chemical contamination:** The project may increase the amount of human-related disturbance on vernal pool crustacean habitats within and adjacent to the proposed project action area. De Weese (1994) found that the most frequently observed adverse impacts to vernal pool species habitat were human-related. Pollutants such as petroleum products, pesticides, herbicides, fertilizers, soap, and other hazardous materials could be conveyed into vernal pool crustacean habitats by overland runoff during the rainy season, thereby adversely affecting the listed vernal pool crustaceans and/or their cysts and their habitats. The runoff from chemical contamination can kill listed species by poisoning. Vernal pool crustaceans are very sensitive to the chemistry of their habitat (Belk 1977; Eng *et al.* 1990; Gozalez *et al.* 1996). Individuals may be killed directly or suffer reduced fitness through physiological stress or a reduction in their food base due to the presence of these chemicals. Vernal pools adjacent to the proposed project site are likely to experience some level contamination by constituents contained in roadway runoff. The project proponent, however, has incorporated into the project's design roadside drainage ditches; these ditches would be constructed along the new alignment in order to contain and filter roadway runoff, thus minimizing the effects of roadway runoff on adjacent vernal pool

crustacean habitat. Contamination of adjacent ponds may increase as a result of increased discharge of sediments into surface waters from landscaped areas. Fertilizer contamination can lead to eutrophication of seasonal ponds, which can kill vernal pool species by reducing concentrations of dissolved oxygen (Rogers 1998). Implementation of Best Management Practices for hydrologic and stormwater features as proposed by the applicant will decrease the potential indirect effects on ponds located adjacent to the project site.

#### *Vernal Pool Fairy Shrimp Critical Habitat*

The indirect effects to the species, described above, similarly affect designated critical habitat and constituent elements for vernal pool fairy shrimp. Indirect effects are more subtle and may occur over a long period of time. The intensity of indirect effects will vary depending on proximity to areas of direct effects, relative elevation, microtopography, and other factors. The habitats that are indirectly affected support habitat components that are essential for the primary biological needs of crustacean feeding, growth, breeding, reproduction, and dispersal, and plant germination, growth, reproduction, and dispersal. Of the 20.957 wetted acres of suitable vernal pool crustacean habitat that will be indirectly affected by the proposed project, approximately 17.124 wetted acres of this is designated critical habitat for the vernal pool fairy shrimp (*i.e.*, Unit 12). Approximately 17.124 wetted acres of designated critical habitat within Unit 12 will be indirectly affected by the proposed project.

Inclusive of the 23.589 wetted acres of direct effects and the 17.124 wetted acres of indirect effects, approximately 1.6 percent of designated critical habitat within Unit 12 will be directly and indirectly affected by the proposed project. This percentage may actually be higher and as much as 2.3 percent, however, if recent and projected development in the region is incorporated (LSA 2004b).

In addition to the adverse effects detailed above, the proposed project will contribute to a local and range-wide trend of habitat loss and degradation, the principal reasons that the vernal pool fairy shrimp and vernal pool tadpole shrimp have declined. The proposed project will contribute to the fragmentation and reduction of the acreage of the remaining listed vernal pool crustacean habitat located in western Placer County and throughout the range of these two listed vernal pool crustaceans.

#### Habitat Preservation

To offset the permanent loss of habitat for listed vernal pool crustaceans, the applicant has proposed such conservation measures as the creation, acquisition, permanent preservation, and management of up to 107.94 wetted acres of vernal pool crustacean habitat. One of the proposed preservation areas includes the 317-acre Aitken Ranch. The 317-acre Aitken Ranch Mitigation Site was established by Wildlands, Inc., a private habitat development company, to preserve and create habitat to offset the habitat losses which result from development in Placer County. This property has approximately 21.16 wetted acres of created or preserved vernal pools and vernal swales, in addition to other habitat features, and vernal pool fairy shrimp are known to occur on this property. Caltrans purchased these habitat preservation and creation values in advance of

environmental document approval to ensure that these resources are protected in perpetuity (Caltrans 2003).

The project proponent has also proposed to acquire the approximately 800-acre Rockwell-Mariner property, located south of Wise Road and west of Dowd Road, northwest of the City of Lincoln. This property has an estimated 79 wetted acres of vernal pool crustacean habitat, all within designated critical habitat for the vernal pool fairy shrimp. This figure has not been confirmed by ground truth techniques or delineation. The presence of listed vernal pool crustaceans are inferred within suitable habitat along the proposed project alignment, including the Rockwell-Mariner property (LSA 2004c). In addition, the project proponent has further proposed to purchase the equivalent of 7.53 acres of vernal pool habitat preservation credits at Bryte Ranch Conservation Bank located in Sacramento County. Bryte Ranch and the proposed project site are located within the same Southeastern Sacramento Valley Vernal Pool Region, as defined in the Service's *Draft Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (2004). The vernal pool crustacean habitats found on the two sites, however, are not comparable in quality and characteristics. Vernal pool crustacean habitat located on Bryte Ranch is qualitatively different from that found on the proposed project site for several reasons, including: 1) Bryte Ranch is located outside of designated critical habitat for the vernal pool fairy shrimp; 2) the soil types found on Bryte Ranch are different from those found on the proposed project site (LSA 2004c); 3) Bryte Ranch is located on a different geo-morphological surface than the proposed project site; and 4) within this Vernal Pool Region, Bryte Ranch is located within the Mather Core Area and the proposed project site is located within the Western Placer County Core Area. According to the Draft Recovery Plan (Service 2004), these core areas were established based on the understanding that these support viable populations of vernal pool species and/or will contribute to the connectivity of habitat and, thus, the increase of dispersal opportunities between populations. The preservation and enhancement of each core area is important to maintain and possibly expand the distribution of vernal pool species range-wide (Service 2004).

Of the 107.94 wetted acres of vernal pool crustacean habitat that the project proponent has proposed to protect in perpetuity, approximately 97.59 of this is existing habitat, and approximately 90.06 acres are located in western Placer County. Of this existing habitat that is proposed to be protected, approximately 81 percent, or approximately 79 acres, is located within designated critical habitat for the vernal pool fairy shrimp in western Placer County. The permanent protection of 90.06 acres of existing vernal pool crustacean habitat in western Placer County will achieve approximately a 69 percent rate of vernal pool crustacean habitat preservation in western Placer County, and likewise, represent approximately a 31 percent rate of vernal pool crustacean habitat loss therein.

### **Cumulative Effects**

Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

A number of highway improvement projects are proposed within the region to address existing congestion and safety concerns while providing for inter-regional transportation needs (Caltrans 2003). These improvements may facilitate planned development in some areas, but are not expected to accelerate conversion of agricultural and other open space lands to developed uses except where this conversion is already occurring or planned, such as in the City of Lincoln (Caltrans 2003). Most of these proposed road improvements are needed to keep pace with local and regional development conditions and prevent further deterioration of service levels and safety. Completed transportation improvement projects include the SR 65 improvement from Roseville to Industrial Avenue, the Blue Oaks Interchange, and the SR 193 improvements. Future improvements to the State highway system include the Wheatland Bypass, the widening of SR 70 between McGowen and Striplin, SR 99 improvements, the Third River Crossing, the Marysville Bypass, and Placer Parkway. These various projects will contribute to cumulative losses of habitat for federally-listed species such as vernal pool crustaceans and the beetle across their range. While these activities may alter the habitats of the vernal pool crustaceans and the beetle and can potentially harass, harm, injure, or kill these species, because they have a federal nexus, they will be subject to section 7 consultation, and, therefore, will be conducted in accordance with standard avoidance and minimization measures for the listed species.

The Service is aware of other projects currently under review by the State, County, and local authorities where biological surveys have documented the occurrence of federally-listed species. These projects include such actions as urban expansion, water transfer projects that may not have a Federal nexus, and continued agricultural development. The cumulative effects of these known actions pose a significant threat to the eventual recovery of these species.

Several specific plans have been developed to govern development in the region. These specific plans are as follows: Twelve Bridges, Lincoln Crossing, Three D, Laehr Estates, Joiner Ranch, Foskett Ranch, Air Center, Lincoln Gardens, and Sterling Point. These specific plans cover a total of 8,460 acres and up to 18,704 residential units and 41,584 people (Caltrans 2003).

The Placer County General Plan identifies the predictable effects of the planned growth within the County. Development under the Land Use Element described in the General Plan could result in a population increase of 45,000 over the 1990 baseline population, mostly occurring in southern Placer County (Caltrans 2003). Up to 17.2 percent, or 5,000 acres, of existing grassland and up to 32.4 percent, or 49,560 acres, of existing agricultural and range lands could be converted to or degraded by planned urban, suburban, and rural residential development in Placer County (Caltrans 2003). This growth and conversion would contribute to several potentially significant affects to listed species, including loss, alteration, or degradation of habitat, particularly of wetlands, degradation of water quality, and increases in the frequency and intensity of flooding.

The majority of vernal pools in the region of western Placer County have been disturbed in some fashion, due in part to agricultural uses (Caltrans 2003). Specific Plan environmental documents have indicated that at least 19.61 acres and as much as 63.62 acres of seasonal wetland habitat could be affected as these plans are implemented (Caltrans 2003). A total of 4,038 acres of vernal pool grasslands, including 25.1 acres of vernal pools and 7.91 acres of seasonal wetlands

that are located within the four-mile circles could be potentially affected by future development (Caltrans 2003; see also FHWA's January 25, 2005, letter to the Service).

#### Valley Elderberry Longhorn Beetle

Continued human population growth in the Central Valley, in general, and the Lincoln area, in particular, is expected to drive further development of agriculture, cities, industry, transportation, and water resources in the foreseeable future. Some of these future activities will not be subject to Federal jurisdiction, and thus are considered to enter into cumulative effects. These future activities are likely to result in loss of riparian and other habitats where elderberry shrubs and the beetle occur.

Many of the activities affecting the beetle may affect elderberry shrubs located within riparian ecosystems adjoining or within jurisdictional wetlands. These projects will be evaluated via formal consultation between the Service and the Corps via the Federal nexus provided by section 404 of the Clean Water Act. There are, however, a number of projects for which there is no need to discharge dredged or fill materials into waters of the U.S. These projects, for which no section 404 permit is required, may lack a Federal nexus and, thus, move forward with no formal consultation. These projects pose a significant threat to the recovery of the beetle, particularly when they result in the removal of elderberry savanna ecosystems. These foothill/upland landscapes often consist of mixed stands of elderberry shrubs and oak (*Quercus* spp.) trees which are interspersed with open grasslands in a savanna-like arrangement.

Elderberry shrubs in these savanna systems often achieve great size, perhaps due to the lack of light competition from broadleaf trees and/or entanglement with California grape (*Vitis californicus*) and/or Himalayan blackberry (*Rubus discolor* syn. *procerus*) vines, as often occurs in riparian communities. Elderberry savanna communities are important in that they represent a large portion of the diverse habitat in which elderberry shrubs occur and because urban sprawl threatens a significant acreage of these systems. This loss of habitat negatively affects the environmental baseline and is difficult to quantify.

#### Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp

Because the vernal pool tadpole shrimp and vernal pool fairy shrimp are endemic to vernal pools in the Central Valley, coastal ranges, and a limited number of sites in the transverse range and Santa Rosa plateau of California, the Service anticipates that a wide range of activities will affect these species. Such activities include, but are not limited to: (1) urban development, (2) water projects, (3) flood control projects, (4) highway projects, (5) utility projects, (6) chemical contaminants, and (7) conversion of vernal pools to agricultural use. Many of these activities will be reviewed under section 7 of the Act as a result of the Federal nexus provided by section 404 of the Federal Water Pollution Control Act, as amended (Clean Water Act).

The proposed project is located in a region where future destruction and modification of vernal pool crustacean habitat is anticipated. Placer County will continue to develop within the County's sphere of influence. Development in the vicinity of the proposed project is expected to result in further destruction of habitat for the listed vernal pool crustaceans. Continued loss of

these habitats throughout the region could conceivably affect the genetic diversity of the local population(s) of listed vernal pool crustaceans. Any loss of genetic diversity can have significant effects on a population's ability to respond to environmental change over time (Frankel and Soulé 1981). Within the proposed action area, the predominant types of non-federal actions that might affect the listed vernal pool crustaceans consist of residential and commercial development.

#### Vernal Pool Fairy Shrimp Critical Habitat

Recent and projected development in western Placer County and in the vicinity of the proposed project is expected to result in the continued degradation and fragmentation of designated critical habitat for the vernal pool fairy shrimp, specifically Unit 12. Already, approximately 521 acres of designated critical habitat in Unit 12 has already been developed around the city of Lincoln (LSA 2004b). Depending on the alternative selected for the City of Lincoln's General Plan, between 2,200 and 3,700 acres of additional critical habitat in Unit 12 could be lost to development (LSA 2004b). The City of Roseville has proposed the development of approximately 5,540 acres of Critical Habitat Unit 12 (LSA 2004b). The combination of recent and proposed development in the cities of Lincoln and Roseville may eventually eliminate up to 9,768 acres, of approximately 31 percent, of the designated Critical Habitat Unit 12 for the vernal pool fairy shrimp.

#### Placer Legacy Habitat Conservation Plan

A number of on-going and proposed projects could contribute to the adverse affects to the beetle, vernal pool crustaceans, and designated critical habitat for the vernal pool fairy shrimp within Placer County as a whole. Within this area, the predominant types of non-federal actions that might affect these species consist of residential and commercial development.

Placer Legacy was established in 1998, using three groups (*i.e.*, Citizens Advisory Committee, Interagency Working Group, and a Scientific Working Group) to provide input from a variety of stakeholders in Placer County, to create a Habitat Conservation Plan (HCP), and to provide a conservation strategy for the region. The Placer Legacy is working on the HCP and a Natural Communities Conservation Plan (NCCP). Placer Legacy's activities should minimize and mitigate for some of the potential effects of facilitated planned growth that may result from the implementation of the proposed project (Caltrans 2003).

So while development activities in western Placer County may negatively affect vernal pool crustaceans and other listed species and their habitats, the HCP/NCCP will eventually ensure that development activities would avoid, minimize, and compensate for take of listed species to the greatest extent possible. The HCP/NCCP would address the indirect effects of facilitated planned development that result from the interrelated and interdependent actions that result from the proposed project. At minimum, the HCP/NCCP will address the Federal and State listed species known at this time that may be affected by actions that are reasonably foreseeable as a result of the proposed action. Additional HCP/NCCP-covered species may be added as the HCP/NCCP is being developed. The HCP/NCCP will be coordinated with CDFG and will include any appropriate State listed species. The HCP/NCCP will address actions that are within



the land use authority of Placer County and are reasonably foreseeable as a result of the proposed action, including land use approvals that are related to entitlements. Additional activities may be added as the HCP/NCCP is developed. The HCP/NCCP will cover a cumulative effects boundary area that is reasonably foreseeable as a result of the proposed project and the future projects.

### **Conclusion**

After reviewing the current status of the beetle, vernal pool fairy shrimp, and vernal pool tadpole shrimp, the environmental baselines for the area covered by this biological opinion, the effects of the proposed project, and the cumulative effects, it is the Service's biological opinion that Route 65 Lincoln Bypass project, as proposed, is not likely to jeopardize the continued existence of these species. Although the proposed project is likely to affect designated critical habitat for the vernal pool fairy shrimp, the conservation measures that have been proposed by the project proponent are sufficient to offset the loss of designated critical habitat of the vernal pool fairy shrimp.

We base this determination for the vernal pool crustaceans on the understanding that the acquisition and conservation of at least 107.94 wetted acres of suitable vernal pool crustacean habitat, including 97.59 acres of existing vernal pool crustacean habitat and 10.35 acres of created vernal pool crustacean habitat, should offset the direct and indirect effects of the proposed action.

Critical habitat has been designated for both the vernal pool tadpole shrimp and the vernal pool fairy shrimp. Because no designated critical habitat for the vernal pool tadpole shrimp exists within the proposed action area, none will be affected. Approximately 1.6 to 2.3 percent of the existing Critical Habitat Unit 12 for the vernal pool fairy shrimp will be adversely affected by the proposed project. At least 78.78 wetted acres of vernal pool crustacean habitat will be protected in perpetuity within designated Critical Habitat Unit 12 for the vernal pool fairy shrimp. Due to the relatively small amount of affects on designated critical habitat in consort with conservation measures which will ultimately achieve an eighty percent rate of preservation of this habitat within Placer County, the Service concludes that the project will not destroy or adversely modify critical habitat.

### **INCIDENTAL TAKE STATEMENT**

Section 9(a)(1) of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened fish and wildlife species without special exemption. Take is defined as harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to a listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the Service to include significant habitat modification or degradation that results in death or injury to listed species by impairing behavioral patterns including breeding, feeding, or sheltering. Incidental take is defined as take

that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with this Incidental Take Statement.

The measures described below are non-discretionary, and must be implemented by the FHWA so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The FHWA has a continuing duty to regulate the activity covered by this incidental take statement. If the FHWA (1) fails to require any entity participating in the project to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, and/or (2) fails to retain oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

### **Amount or Extent of Take**

#### **Valley Elderberry Longhorn Beetle**

The Service anticipates incidental take of the beetle will be difficult to detect or quantify. The cryptic nature of these species and their relatively small body size make the finding of an injured or dead specimen unlikely. The species occurs in habitats that make them difficult to detect. Due to the difficulty in quantifying the number of valley elderberry longhorn beetles that will be taken as a result of the proposed project, the Service is quantifying take incidental to the project as all valley elderberry longhorn beetles inhabiting or otherwise utilizing the elderberry shrubs/savannas containing stems 1.0 inch or greater in diameter at ground level located within 20 feet of the centerline of the proposed alignment on the project site. Therefore, the proposed project may incidentally take all beetles inhabiting two elderberry shrubs, totaling three stems measuring between one and three inches in diameter, five stems measuring between three and five inches in diameter, and two stems measuring greater than five inches in diameter on the proposed project site.

#### **Vernal Pool Tadpole Shrimp and Vernal Pool Fairy Shrimp**

Construction activities associated with the proposed project will directly affect 26.941 acres of listed vernal pool crustacean habitat, including 23.589 acres of designated critical habitat for the vernal pool fairy shrimp. Construction activities associated with the proposed project will indirectly affect 20.957 acres of listed vernal pool crustacean habitat, including 17.124 acres of designated critical habitat for the vernal pool fairy shrimp. Therefore, the proposed project will result in take of listed vernal pool crustacean species. The Service anticipates incidental take of vernal pool tadpole shrimp and vernal pool fairy shrimp will be difficult to detect or quantify for the following reasons: the aquatic nature of the organisms and their relatively small body size make the finding of a dead specimen unlikely; losses may be masked by seasonal fluctuations in numbers and other causes; and the species occurs in habitat that makes them difficult to detect. Due to the difficulty in quantifying the number of vernal pool fairy shrimp and vernal pool tadpole shrimp that will be killed as a result of the proposed action, the Service is quantifying take incidental to the project as the number of acres of vernal pool crustacean habitat that will

become unsuitable for the listed species due to indirect effects as a result of the proposed project. Therefore, the Service estimates that all vernal pool fairy shrimp and vernal pool tadpole shrimp inhabiting 47.898 acres of vernal pool crustacean habitat will become harassed, harmed, injured, or killed, as a result of the proposed project.

#### Vernal Pool Fairy Shrimp Critical Habitat

Approximately 40.713 acres of vernal pool fairy shrimp designated Critical Habitat Unit 12 will be permanently lost or degraded due to construction activities associated with the implementation of the proposed project. This loss represents 1.6 to 2.3 percent of Unit 12, and 0.005 percent of all designated fairy shrimp critical habitat. The 78.78 acres of vernal pool crustacean habitat on the approximately 800-acre Rockwell-Mariner property is within designated vernal pool fairy shrimp Critical Habitat Unit 12, which represents approximately 2.5 percent of Unit 12, will be protected in perpetuity.

Upon implementation of the following reasonable and prudent measures, incidental take associated with the proposed project on the beetle and vernal pool crustaceans in the form of harm, harassment, or death from habitat loss or direct mortality will become exempt from the prohibitions described under section 9 of the Act for direct and indirect effects. The incidental take associated with the proposed project is hereby exempted from prohibitions of take under section 9 of the Act.

#### **Effect of the Take**

In the accompanying biological opinion, the Service has determined that this level of anticipated take is not likely to result in jeopardy to the beetle and listed vernal pool crustaceans. Approximately 40.173 acres of designated critical habitat for the vernal pool fairy shrimp will be adversely affected and/or permanently lost. The proposed conservation measures, however, are sufficient to offset the loss of this designated critical habitat.

#### **Reasonable and Prudent Measures**

The Service has determined that the following reasonable and prudent measures are necessary and appropriate to minimize the effects of the proposed project on the vernal pool tadpole shrimp and vernal pool fairy shrimp.

1. FHWA shall minimize the adverse effects of the proposed project on the beetle and vernal pool crustaceans.
2. FHWA shall minimize temporary and permanent losses and degradation of habitat of the beetle and vernal pool crustaceans, and, to the greatest extent practicable, restore these habitats.

## Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the FHWA must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1. The following terms and conditions implement reasonable and prudent measure number one (1):
  - a. The FHWA shall assure all conservation measures as proposed by the project proponent as described in the *Draft Mitigation and Monitoring Proposal for Route 65 Lincoln Bypass, Placer County, California* (LSA 2004c), on pages 56-59 of the *Route 65 Lincoln Bypass Biological Assessment* (LSA 2004a), the September 7, 2004, letter from FHWA to the Service, in the notes from the July 20, September 16, October 19, November 1, and November 5, 2004 meetings between the Service, FHWA, Caltrans, and other participants), and identified by the Service in the project description of our biological opinion are fully implemented.
  - b. FHWA shall assure the following "Best Management Practices" (BMPs) are implemented during project construction:
    - i. The project proponent shall include a copy of this biological opinion within its solicitations for construction of the proposed project, making the prime contractor responsible for implementing all requirements and obligations included within the project description of this biological opinion, and to educate and inform all other contractors involved in the project as to the requirements of the biological opinion. The project proponents shall make all applicable terms and conditions in this biological opinion a required item in all contracts for the project that are issued by the State to all contractors.
    - ii. At least 30 calendar days prior to initiating construction activities, the project proponents shall submit the names and curriculum vitae of the biological monitor(s) for the project.
    - iii. A Worker Environmental Awareness Training Program for construction personnel shall be conducted before the commencement of construction. The program shall provide workers with information on their responsibilities with regard to the listed vernal pool crustaceans and beetle, an overview of the life-history of these species, information on take prohibitions, and an explanation of the relevant terms and conditions of this biological opinion. Written documentation of the training must be submitted to the Sacramento Fish and Wildlife Office within three (3) working days of the completion of instruction.
    - iv. To ensure that the temporary loss of vernal pool crustacean habitat will be confined to the proposed project site, prior to groundbreaking, high-visibility fencing shall be placed along the boundaries of the construction zone to clearly

mark this zone and to prevent construction vehicles or personnel from straying onto adjacent off-site habitat. A Service-approved biologist shall assist in the identification of environmentally sensitive areas and direct the placement of high-visibility fencing on the project site. Such fencing will be inspected by the Resident Engineer and/or Construction Inspectors at the beginning of each work day and maintained in good condition. The fencing may be removed only when the construction of the project is completed.

- v. A Service-approved biologist shall conduct weekly inspections of the project site throughout the period that construction activities may affect adjacent vernal pool habitat. The biologist shall be on-call and available at all times for on-site inspection throughout the duration of project construction. The biologist, the Resident Engineer, and Construction Inspectors shall have the authority to halt any action that might result in take of listed species. If construction activities are halted under this authority, the Service and the CDFG shall be notified by telephone and letter within one (1) working day.
- vi. During construction operations, the number of access routes, number and size of staging areas, and the total area of the proposed project activity will be limited to the minimum necessary. Routes and boundaries will be clearly demarcated. Movement of heavy equipment to and from the project site will be restricted to established roadways to minimize habitat disturbance. The stockpiling of construction materials, portable equipment, vehicles, and supplies will be restricted to the designated construction staging areas and exclusive of the wetland avoidance areas. All fueling, cleaning, and maintenance of vehicles and other equipment will occur only within designated areas and at least 250 feet away from any wetland habitats. The applicant will ensure contamination of habitat does not occur during such operations. All workers will be informed of the importance of preventing spills and appropriate measures to take should a spill occur. Any spills or hazardous materials will be cleaned up immediately. Such spills will be reported in the post-construction compliance reports.
- vii. To control erosion during and after implementation of the project, the applicant will implement best management practices (BMPs), as identified by the Central Valley Regional Water Quality Control Board. Erosion control measures and BMPs, which retain soil or sediment, runoff from dust control, and hazardous materials on the construction site and prevent these from entering the vernal pool complexes, will be placed, monitored, and maintained throughout the construction operations. These measures and BMPs may include, but are not limited to, silt fencing, sterile hay bales, vegetative strips, hydroseeding, and temporary sediment disposal. The Stormwater Pollution Prevention Plan (SWPPP) described in the Description of the Proposed Action section of this Biological Opinion shall include these and any other measures necessary to prevent the discharge of contaminated runoff onto the adjacent offsite wetland habitats.

- viii. All heavy equipment, vehicles, and supplies will be stored at the designated staging area at the end of each work period. The stockpiling of construction materials, portable equipment, vehicles, and supplies will be restricted to the designated construction staging areas and exclusive of the open space/wetland preserve and offsite wetland avoidance areas. Staging areas for construction equipment will be located so that spills of oil, grease or other petroleum by-products will not be discharged into any watercourse or sensitive habitat. All fueling, cleaning, maintenance, and staging of vehicles and other equipment will occur only within designated areas and at least 250 feet away from the open space/wetland preserve and any off-site vernal pool crustacean habitats. All machinery will be properly maintained and cleaned to prevent spills and leaks. All workers will be informed of the importance of preventing spills and appropriate measures to take should a spill occur. Any spills or hazardous materials will be cleaned up immediately in accordance with applicable local, state and/or federal regulations. Such spills will be reported in the post-construction compliance reports.
  - c. If requested during or upon completion of construction activities, the on-site biologist or the applicant's representative shall accompany the Service or CDFG personnel on an on-site inspection to review project effects on the beetle and listed vernal pool crustaceans.
  - d. FHWA shall ensure the applicant complies with the *Reporting Requirements* of this biological opinion.
2. The following terms and conditions implement reasonable and prudent measure number two (2):
- a. Valley Elderberry Longhorn Beetle
    - i. The 2 elderberry shrubs, which are located within 20 feet of the centerline of the proposed alignment of the project and cannot be avoided, shall be transplanted to a Service-approved conservation area. Transplanting must occur while the elderberry plants are dormant, between November and the first two weeks of February, after they have lost their leaves. The Service will be consulted prior to transplantation and a Service-approved biologist will monitor the transplanting activities. These shrubs will be transplanted according to the Service's July 9, 1999 *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (Beetle Conservation Guidelines; Service 1999).
    - ii. To compensate for direct affects to the beetle, prior to ground breaking activities at the project site, the project proponents will establish 29 rooted elderberry seedlings and 29 associated native plants at a Service-approved conservation area.

- iii. The proposed conservation area is the 317-acre Aitken Ranch property, located west of the City of Lincoln in western Placer County (*see* page 53 of the Biological Assessment and page 76 of the MMP). The project applicant proposes to establish the two transplanted shrubs and the seedlings and plantings on this property. The minimum area required is 0.24 acre (10,440 square feet) to ensure that no more than five elderberry seedlings and five associated native plants are planted per 1,800 square feet. The conservation area shall be managed and monitored in perpetuity as outlined in the Beetle Conservation Guidelines (Service 1999). This includes the management and monitoring of the conservation area for either ten (10) consecutive years or seven (7) years over a 15-year period, with monitoring reports submitted for each monitoring year. Additionally, a management plan must be prepared which describes the long-term protection of this conservation area in order to protect the area in perpetuity as habitat for the beetle. Wildlands, Inc. will oversee the transplanting and long-term management and supervision of the conservation area.

b. Vernal Pool Crustaceans

- i. The project proponent has proposed to offset direct and indirect effects of vernal pool crustacean habitat loss through a combination of habitat preservation and creation offsite. Therefore, prior to ground-breaking, the applicant shall preserve in perpetuity at least 107.94 wetted acres, including 97.59 acres of existing and 10.35 acres of created, vernal pool crustacean habitat. The preservation of vernal pool crustacean habitat will be accomplished through the acquisition of specified properties, such as Aitken Ranch and the Rockwell-Mariner property in Placer County. Additional preservation will occur through the purchase of equivalent vernal pool habitat preservation credits commensurate with acreage commitment at the Bryte Ranch Conservation Bank in Sacramento County. The creation of vernal pool crustacean habitat will occur on Aitken Ranch.
- ii. At least 120 days prior to construction, the applicant shall submit documentation of the preservation habitat including conservation easements, management plans, funding instruments, easement holders, etc. for Service approval. Prior to groundbreaking, the project proponent shall provide documentation to the Service demonstrating the dedication of remaining credits commensurate with acreage commitment at the Bryte Ranch Conservation Bank.
- iii. The uppermost layer of soil in seasonally inundated habitat may contain cysts of listed vernal pool crustaceans. Therefore, before these wetlands are filled, the top layer of soil shall be made available prior to the start of the project grading to a vernal pool creation bank that requests it, with Service approval, for inoculating newly created vernal pools in western Placer County. The applicant will attempt to identify potential recipient sites. Soils stockpiled for this

purpose will be shielded from rain with a water-proof cover to ensure that it remains completely dry.

- c. After construction activities are complete, any temporary fill or construction debris shall be removed and disturbed areas restored to their pre-project conditions.
- d. The project proponents will maintain and monitor the project site for one (1) year following the completion of construction and restoration activities. Monitoring reports documenting the restoration effort should be submitted to the Service upon the completion of the restoration implementation and one (1) year after the restoration implementation. Monitoring reports should include photo-documentation, when restoration was completed, what materials were used, specified plantings, and justifications of any substitutions to the Service-recommended guidelines.

### **Reporting Requirements**

Any contractor or employee who, during routine operations and maintenance activities, inadvertently kills or injures a listed wildlife species must immediately report the incident to their representative. The Service is to be notified within one (1) working day of the finding of any dead or injured listed wildlife species or any unanticipated take of the species addressed in this biological opinion. The Service contact persons for this are the Division Chief, Endangered Species Division (Central Valley) at (916) 414-6600 and Resident Agent-in-charge Scott Heard at (916) 414-6660.

The Service-approved biologist shall notify the Service immediately if any listed species are found on site, and shall submit a report including the date(s), location(s), habitat description, and any corrective measures taken to protect the species found. The Service-approved biologist shall submit locality information to the CDFG, using completed California Native Species Field Survey Forms, no more than 30 calendar days after completing the last field visit of the project site. Each form shall have an accompanying scale map of the site, such as a photocopy of a portion of the appropriate 7.5-minute U.S. Geological Survey map and shall provide at least the following information: township, range, and quarter section; name of the 7.5-minute or 15-minute quadrangle; dates (day, month, year) of field work; number of individuals and life stage, where appropriate, encountered; and a description of the habitat by community-vegetation type. The Service-approved biologist shall also provide a high quality copy of this information to the staff zoologist, California Department of Fish and Game, 1807 13<sup>th</sup> Street, Sacramento, California, 95814, phone (916) 445-0045.

The Sacramento Fish and Wildlife Office is to be notified within one (1) working day of the finding of any dead or injured listed wildlife species or any unanticipated take of the species addressed in this biological opinion. Any other federally listed or candidate species found on or adjacent to the project area must be reported within three working days of its finding. The Service contact person for this is the Chief, Endangered Species Division at (916) 414-6620.

Any dead or severely injured valley elderberry longhorn beetles found (adult, pupae, or larvae) shall be deposited in the Entomology Department of the California Academy of Sciences. The



Academy's contact in the Senior Curator of Coleoptera at (415) 750-7239. All observations of valley elderberry longhorn beetle—live, injured, or dead—or fresh beetle exit holes shall be recorded on California Natural Diversity Data Base (CNDDB) field sheets and sent to California Department of Fish and Game, Wildlife Habitat Data Analysis Branch, 1416 Ninth Street, Sacramento, California 95814.

The project proponents shall submit a post-construction compliance report prepared by the monitoring biologists to the Sacramento Fish and Wildlife Office within 30 calendar days of the completion of construction activity. This report shall detail the following: (1) dates that construction occurred; (2) pertinent information concerning the success of the project in meeting conservation measures; (3) an explanation of failure to meet such measures, if any and recommendations for remedial actions and request for approval from the Service, if necessary; (4) known project effects on beetles and vernal pool crustaceans; (5) occurrence of incidental take of beetles and/or vernal pool crustaceans, if any; and (6) other pertinent information.

### CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities that can be implemented to further the purposes of the Act, such as preservation of endangered species habitat, implementation of recovery actions, or development of information and data bases.

1. FHWA should work with the Service to address significant, unavoidable environmental effects resulting from projects proposed by non-Federal parties.
2. FHWA should assist the Service in the implementation of recovery efforts for the beetle.
3. As recovery plans for listed vernal pool crustacean species are developed, FHWA should assist the Service in their implementation.
4. FHWA, in partnership with the Service, should develop maintenance guidelines for FHWA projects that will reduce adverse effects of routine maintenance on the beetle and vernal pool crustaceans and their habitats. Such action may contribute to the delisting and recovery of these species by preventing degradation of existing habitat and increasing the amount and stability of suitable habitat.


In order for the Service to be kept informed of actions minimizing or avoiding effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

### REINITIATION--CLOSING STATEMENT

This concludes formal consultation with FHWA on the proposed Route 65 Lincoln Bypass project. As provided in 50 CFR §402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending re-initiation.

Please contact this office at (916) 414-6600, if you have any questions regarding the proposed Route 65 Lincoln Bypass project.

Sincerely,

A handwritten signature in black ink, appearing to read "Kenneth Sanchez", written in a cursive style.

Kenneth Sanchez  
Acting Field Supervisor

cc:

ARD (ES), Portland, OR

Mr. Thomas Cavanaugh, US Army Corps of Engineers, Sacramento, CA

Mr. Gary Sweeten, Federal Highway Administration, Sacramento, CA

Mr. Chris Collison, California Department of Transportation, Sacramento, CA

Mr. Kent Smith, California Dept. of Fish and Game, Rancho Cordova, CA

Ms. Celia McAdam, Placer County Transportation Planning Agency, Auburn, CA

Tables 1, 2, and 3 – In Text

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